

MODERN PROFESSIONAL NURSING

General Editor

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VOLUME FOUR

THE CAXTON PUBLISHING CO. LTD.
MORLEY HALL, ST. GEORGE STREET, HANOVER SQUARE
LONDON, W.1

FIRST PUBLISHED	.	.	<i>April 1922</i>
REPRINTED	.	.	<i>October 1949</i>
REPRINTED	.	.	<i>June 1950</i>
REPRINTED	.	.	<i>August 1951</i>
REPRINTED	.	.	<i>May 1954</i>
REPRINTED	.	.	<i>January 1956</i>

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MODERN PROFESSIONAL NURSING

VOLUME IV

• • *SECTION • X*

SURGICAL NURSING

CHAPTER I

INFLAMMATION AND THE PROCESS OF REPAIR

CAUSES OF INFLAMMATION. SYMPTOMS AND SIGNS.
TREATMENT. CHRONIC INFLAMMATION. SYMPTOMS AND
SIGNS. TREATMENT.

INFLAMMATION is a demonstration by the bodily tissues that they are responding to injury. The aim is to localize and counteract the effects of the injury and the reaction takes place in every case in which the vitality of the part is not destroyed by the agent.

Causes of Inflammation.—Inflammatory reaction may occur in response to injury by heat, cold, friction, chemicals or physical agents such as x-rays and sunlight. The commonest cause, however, is the entry into the tissues of disease-producing organisms as already stated in this work (see Vol. II, Section III, p. 4). These minute invaders are present everywhere; few wounds are completely free from them. Accordingly, in most cases the inflammatory reaction is a portrayal of the battle being fought between the invading bacteria and the body tissues. The result of this battle depends first on the virulence of the attacking organisms and then on the general resistance of the individual attacked. Thus cardiac weakness, senility, gout, diabetes and chronic alcoholism lower the general resistance while locally poor circulation, impaired innervation or impaired nutrition fight on the side of the invaders.

Symptoms and Signs.—The local signs are redness, heat, swelling, pain and loss or impairment of function. Each is the index of a vital reaction. Let us follow the process from the beginning. At the site of the injury (abrasion of skin or mucous membrane) the blood flow is quickened, the arterioles, capillaries and venules dilate to accommodate the increased blood-supply and

2 INFLAMMATION AND THE PROCESS OF REPAIR

the part becomes red and hot. In this way phagocytes, antibodies and antitoxins are rushed to the spot, and when the infection is a mild one, soon deal with the invasion. In graver cases the congestion becomes more marked. The blood stream slows and stasis occurs; there is an increased exudation of lymph from the distended vessels; the phagocytes, slipping through the capillary walls, hurry to form a ring round the damaged area and attack the enemy. The lymphatic vessels are incapable of draining away all the excess fluid and the part becomes waterlogged and tense, giving rise to the swelling and pain. The congestion and consequent pain lead to impairment of the function of the area, e.g. the inflamed joint will not bend, or secretion of urine fails when there is an inflamed kidney.

The general reaction is marked by pyrexia, the height of the fever varying with the virulence of the attack. The pulse increases in rate, and insomnia, restlessness and delirium may occur; the appetite fails and the urine becomes scanty and concentrated. When the microbes are beaten off at the first attack, the symptoms rapidly subside, no permanent change occurs and resolution is said to have taken place. Should the microbes be victorious to any degree suppuration occurs; in this event the local cells die and break down, and with the lymph and dying leucocytes form a foul-smelling, creamy liquid called pus. This fluid is usually swarming with bacteria and must be discharged from the body before healing can take place.

A more determined attack may lead to necrosis (death of a considerable portion of tissue), a slough being formed in soft tissue or a sequestrum in bone. Finally a limb or part of a limb may be deprived of its blood-supply and the whole limb may rot (gangrene).

Rarely do the bacteria completely succeed, however. The defensive guards of the body quickly get to work. Some of the leucocytes eat up the invading organisms (phagocytosis), others form a ring round the affected area in an attempt to localize the trouble, others die in defence of their territory, their bodies joining the mass of pus that speedily collects. The antitoxins neutralize the poisons the bacteria are producing, other substances—opsonins—act as a sauce, making it easier for the leucocytes to succeed. Fibrosis or scarring occurs, forming an impregnable barrier, and the collected pus gradually passes along the tissue planes to the body surface, breaking through it and slowly draining away. Scar tissue draws the walls of the cavity together and completes the repair. In cases in which the damage is superficial a saucer-like erosion, known as an ulcer, may form and much tissue may be destroyed; granulation tissue gradually bridges the gap, new epithelium encroaches from the sides and finally after many months only a small scar remains.

Treatment.—Local treatment aims at removing the cause, obtaining adequate rest and relieving tension. Any foreign body should be removed and dead tissue cut away. The part should be supported by sling or splint, and raised if possible. Cold, by limiting swelling, eases pain in non-infected cases, whereas hot applications are soothing and hasten the formation of pus in infected ones. Wounds may be dressed with antiseptics—e.g. flavine—which inhibit the growth of bacteria, or with hygroscopic substances such as hypertonic saline which by increasing the outpouring of lymph wash organisms away. The making of free incision may be necessary to relieve tension and avert gangrene, while leeching may be resorted to in special cases.

So far as general treatment is concerned this aims at building up the body's defences, destroying the bacteria and eliminating the toxins. Rest in bed is advisable in all but the mildest cases. The diet should be a fluid one while the temperature is high; fruit juice and glucose are of value and a fluid intake of 5 or 6 pints daily should be aimed at. The sensitivity of the organism is discovered and the appropriate antibiotic, penicillin, streptomycin, chloromycetin, aureomycin or terramycin is ordered, or a course of sulphonamides may be started. Serum therapy is sometimes useful. Adequate sleep must be obtained, and sedative drugs may be necessary for the relief of pain. Kidney action may be stimulated by diuretics and the bowels regulated by gentle laxatives. In the healing stage, tonics, preparations of vitamins A, B and C and natural or artificial sunlight therapy are of value.

Chronic Inflammation .

In some cases the reaction to injury or bacterial invasion is less acute and the whole process is restrained, but the results over a long period may be very serious to the constitution of the patient. This form of inflammation is common in tuberculosis and in syphilis, there being no suppurative process, but rather a slow and definite growth of fibrous tissue. When the patient has suffered for years from the constant irritation of a foreign body or from pressure on a part, a mild but distinct form of chronic inflammation occurs. This is also the rule in chronic rheumatism and gout.

Symptoms and Signs.—The effects of chronic inflammation vary according to the organ or area. Generally there is thickening and hardness, e.g. of skin, bone or gland. The tuberculous process has been already described; when the caseated matter liquefies, a cold abscess may be formed. It is typical of syphilis that it continues to increase the connective tissue of the body by depositing layers of fibrous tissue which thickens, hardens and causes loss of mobility of tissues.

4 INFLAMMATION AND THE PROCESS OF REPAIR

Treatment.—Naturally we must first deal with the cause, not always an easy matter. While heat is useful, it must be applied in the more restricted form, and thus counter-irritation (see Vol. III, p. 44) in all its branches may be instituted. Friction, massage, various kinds of electrical treatment including diathermy, vaccine treatment and sometimes incision are all indicated when the condition is obstinate, as it frequently is. A cold abscess is usually evacuated by aspiration. Should this prove inadequate the abscess may be incised and the contents removed. Penicillin or iodoform is then applied to the walls of the cavity, which are drawn together by one or two sutures. Finally the skin sutures are inserted and a pressure dressing is applied. These cavities are never left to drain because of the danger of secondary infection. The pyogenic bacteria can easily gain a foothold on devitalized tissue. The usual general nursing and diet are essential. Mention should be made especially of Bier's treatment, which causes passive congestion of an area by pressure on the veins. This is done by fixing a rubber band round the limb (often the finger) and adjusting it so that it makes the skin purple-red, but not dark blue or anaemic. The arterial flow must on no account be impeded. By this method, the part is put into a state of passive hyperaemia. In many cases, 1 hour's treatment will suffice, but with careful application and supervision the treatment may go on all day. When Bier's treatment is indicated over, say, the back of the neck, we use a glass bell with attached suction ball, as described and illustrated in Vol. III, p. 48, and by exhausting the air in the bell, increase the blood to the part, exactly as is done in cupping. This method can also be used to aspirate large boils or tuberculous sinuses.

CHAPTER 2

HAEMORRHAGE

TYPES OF HAEMORRHAGE. RESULTS OF SEVERE HAEMORRHAGE.
TREATMENT. VENOUS HAEMORRHAGE. CHRONIC HAEMORRHAGE.

A FULL account is given of the first-aid treatment of haemorrhage in Vol. I, pp. 312-323, therefore many of the points need not be repeated. Certain additional factors must be considered from the orthodox surgical aspect however, and we may extend our knowledge to include haemorrhage in its fullest understanding.

Types of Haemorrhage.—

1. *Primary Arterial Haemorrhage*.—This is the initial haemorrhage which occurs as the blood vessel is injured, whether by accident, during an operation or by rupture of an internal vessel whose wall is weakened by disease, as in arteriosclerosis.

2. *Recurrent (Reactionary) Arterial Haemorrhage*.—When an artery is cut the blood tends to clot, but in addition to this natural plug there is a contraction of the middle muscular coat, which, with the inner coat doubles back inside the fibrous coat, making the lumen of the tube smaller. The force of the heart beat is lessened by the associated shock and the escaping blood clots, filling the opening and sealing it off. This is a temporary measure; the permanent sealing of the artery gradually takes place by organization of the blood clot, fibrous tissue infiltrating and replacing the original clot.

At times the temporary measures fail—usually within 24 hours of the injury—and bleeding recommences; this is called reactionary or recurrent haemorrhage and occurs in the following way. As the patient recovers from the shock and moves about the bed, the heart beat increases in force and the partly formed clots, no longer able to withstand the pressure, are dislodged, thus unsealing the torn vessels. Sometimes the increased blood pressure associated with post-operative vomiting is sufficient to dislodge a ligature, with a similar effect.

3. *Secondary Arterial Haemorrhage*.—In a septic wound the blood clot, instead of being organized by fibrous tissue, may be invaded by the bacteria and may slowly crumble away, opening up the blood vessel again; or the wall of the artery may slowly become ulcerated and finally perforated. This occurs in 8 to 12 days after

the injury and leads to a secondary haemorrhage. Slight oozing from a septic wound after the first week should always be reported immediately, as it is often followed in a few hours by a severe haemorrhage.

Results of Severe Haemorrhage.—A rapid loss of blood causes great faintness (syncope). This may be quickly fatal or in milder cases only transient. This phase occurs whether the loss of blood proceeds from a single large artery or from the tearing of several medium vessels. Recovering from the faint the patient becomes restless; the mind is clear and he complains of thirst. Increasing pallor, with blanching of the mucous membranes, increasing pulse rate with falling tension and rapid, sighing respirations (air hunger) will be noted. The skin becomes cold and clammy and attempts at movement will cause giddiness. Gradually true shock supervenes; the temperature falls below normal, the pulse becomes imperceptible and consciousness is slowly lost. These symptoms appear whether the bleeding occurs externally or internally. In a surgical ward, nurses should be constantly on the watch for the early signs so that medical aid may be given as early as possible.

Treatment.—First-aid methods, already fully discussed in Vol. I, pp. 310 and 311, should be adopted. In the ward, the

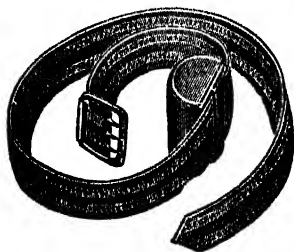


FIG. 1.—TOURNIQUET. SIMPLEX PATTERN.

(By courtesy of the Surgical Manufacturing Co., Ltd., London)

nurse should quickly raise the foot of the bed, keeping the patient's head as low as possible, provided it is not the site of the haemorrhage. She should reassure the patient, and send a colleague to summon the sister and house-surgeon. Then, when the bleeding is external, she should apply pressure to the wound by an additional pad of wool and a firm bandage or if this be not sufficient cut off the arterial supply by digital pressure or a tourniquet. (See Fig. 1 and also Vol. I, p. 315;

Vol. II, p. 381.) The part should be raised and immobilized, the patient kept warm and quiet and a good supply of air established. When the doctor arrives, morphine will no doubt be given without delay, and an intravenous drip of saline or a blood transfusion may be necessary. Sometimes preparations such as coagulens-Ciba or haemostatic serum will be given by injection intramuscularly, or Russell viper venom in dilute (1 in 10,000) solution may be applied locally to control capillary oozing. Vitamin K and calcium are useful particularly in cases of jaundice, while the older styptics, turpentine and adrenalin, are sometimes used locally.

In many cases the patient will have to be returned to the operating theatre for control of the bleeding point. This may be brought about 1. by torsion, the artery being seized by the Spencer Wells forceps and twisted; 2. by ligation in which catgut or silk is tied round the injured vessel; 3. by diathermy knife or cautery; or 4. by acupressure. The last method is rarely used; to carry it out a needle is passed behind the blood vessel and a figure of 8 ligature passed round it. Heat (water 130°F.) or cold (ice cold compresses) will sometimes control the loss from small vessels.

After a severe loss of blood the patient should be confined to bed for at least 14 days; provision of extra fluids and of a varied diet are essential. Anaemia may be combated by giving iron tonics, or if severe by blood transfusion. The blood picture should have returned to normal limits before the patient is discharged.

Venous Haemorrhage.—Varicose veins tend to continue to bleed because of the rigid walls. Ligature is done in the usual way, although owing to the danger of allowing air to enter a vein, the latter should be tied with 2 ligatures in the first place then divided between. In the event of much air entry, there is grave danger of death from air embolism.

Chronic Haemorrhage.—Small recurrent losses of blood, such as those which may occur from piles or chronic uterine affections and which persist for weeks or months, are very debilitating. Secondary anaemia develops and the bodily resistance is lowered. The cause should be ascertained and treated as soon as possible.

CHAPTER 3

BURNS AND ULCERS

BURNS AND SCALDS. STAGES. TREATMENT. FROST-BITE. CHILBLAINS. ULCERATION. CAUSES. SYMPTOMS AND SIGNS. TYPES OF ULCER. TREATMENT. BEDSORE.

THE causes of burning and scalding have already been dealt with in Vol. I, pp. 337-339, and there remains the discussion of the various stages through which the patient may pass after he is under medical supervision at home or in the hospital.

Burns and Scalds

We have already learned that there are various degrees of burning; the classification of the great surgeon Dupuytren has been briefly tabulated on the opposite page. The classification in common use today has been simplified and the degrees reduced to three, as indicated in the table. We shall consider only the modern classification.

Stages.—In the more severe burns, the process of healing passes through 3 stages, referring to the local as well as to the constitutional condition, as described below.

Stage 1.—Locally the tissues are in a stage of destruction and the constitutional reaction is one of shock. It should be remembered that shock does not depend so much on the depth of the burn as on its superficial extent. The shock is also influenced by the site of the burn; for instance a burn of the face or trunk is far more serious than a burn of one of the limbs. Children and old people are the worst sufferers. We can never be dogmatic about the effect of a burn. Cases have occurred in which death took place as a result of severe burning of only a part of a limb; on the other hand a stoker, who is working with his naked body exposed above the waist line, may succumb to the most superficial general scorching as a result of a back draught from the fire. In this stage many of the internal organs become congested, including the kidneys, which are overworked in an endeavour to get rid of the poisons absorbed from the large exposed dermal field. The shock which follows immediately upon the occurrence is typical of shock elsewhere, but it generally passes off in a few hours, the patient rallying in 95 per cent of cases.

TABLE SHOWING DEGREES OF BURNS

<i>Dupuytren's Classification</i>		<i>Modern Classification</i>		<i>Symptoms and Results</i>
<i>Degree</i>	<i>Character</i>	<i>Degree</i>	<i>Character</i>	
1.	Simple red- dening of the skin; hairs singcd; slight scorching.		(Not included.)	
	Blistering.	1.	Blistering.	The cuticle is raised as the "roof" of the blister.
3.	Destruction of cuticle and part of dermis. The glands and follicles are not destroyed.	2.	Partial skin destruction.	Intense pain owing to exposure of nerve endings. Healing may produce a white thin scar, but there is no contrac- ture as the epithe- lium of the part quickly re-forms, and the repair is speedy.
4.	The skin is destroyed entirely.	3.	Destruction of whole thickness of skin.	Owing to destruc- tion of nerve end- ings the pain is not so great as in the previous degree. Generally there is some involvement of the superficial fascia, and after the slough of dead skin is removed, healing takes place from the floor of the ulcer so created, but there is nearly always a de- posit of thick, tough and contracted fib- rous tissue, thus deformities are the rule.
5.	The burns ex- tend to the deep fascia and muscle.		(Included in degree 3.)	Great scarring and deformity.
6.	Charring of the thickness of a whole limb, even to the bone.		do.	Amputation usually inevitable.

Stage 2.—The predominant feature of this stage is toxæmia. Owing to modern methods described below, the mortality rate has been greatly reduced but at one time about 75 per cent of those suffering from severe burns died of general blood poisoning. The symptoms appear within the first 24 hours when prompt antitoxic measures are not adopted. This stage coincides with the period during which the sloughs are separating, and it is a very critical time. High fever, restlessness, slight cyanosis, vomiting, must all be expected, while breathing is rapid and the pulse is fast and weak. Delirium and coma usually precede a fatal termination. It must not be forgotten that complications such as pneumonia, pleurisy, meningitis, duodenal ulcer or peritonitis may occur, while nephritis is common. The wound may become very septic, especially when the slough is difficult to move.

Stage 3.—The stage of healing. Assuming that the slough has been removed and that sepsis has been counteracted, burns of the 3rd degree and severer slowly form granulation tissue (see pp. 2, 13), and this becomes covered by a layer of rapidly growing epithelium which creeps in slowly from the rim of the ulcer. Healing goes on quickly after the danger of sepsis is past.

Treatment.—Treatment aims at controlling shock, limiting toxæmia, speeding repair and preventing scarring and deformity.

General.—When proper first-aid treatment has been given, the patient should be gently lifted into a warm bed, the foot of which is raised on blocks. A radiant heat cradle or hot water bottles may be used to prevent heat loss, but the temperature (105°F.) should not be sufficient to cause sweating. Sips of glucose water or of warm sweet tea may be allowed if there be no vomiting, morphine should be given to control pain and the patient should be reassured and left to rest. Frequent estimations of the pulse rate and of the blood pressure must be made. Should secondary shock develop, the doctor in charge must be quickly notified, an intravenous plasma transfusion may be commenced and oxygen administered and cortine injections ordered.

When shock is adequately controlled, and if possible, within 8 hours of the accident, a careful cleansing of the burned area is undertaken. A small section only is exposed at a time; all blisters are snipped, dead tissue is removed and suitable local treatment is given. Gas and oxygen is the anaesthetic of choice. On the patient's return to bed, anti-shock treatment is continued. Copious fluids by mouth, rectum or intravenously reduce the danger of kidney involvement, while penicillin or sulphonamides may be ordered to counteract possible infection. Extra glucose is of value, and a nourishing diet, of high protein content, is introduced as soon as possible. Sedatives may be necessary in the early days; later on tonics are ordered to counteract anaemia.

Local.—Burns of the first degree may be dusted with sodium bicarbonate or boric powder, covered by gauze and lightly bandaged. When blistering is present, all dead tissue is removed and a pressure dressing of *tulle gras*, or a tyrothricin compress, may be applied, but some surgeons prefer to leave the surface exposed, applying layer after layer of penicillin powder until the surface is dry, while others rely on immediate skin graft where possible. Coagulative treatment once popular is rarely used today.

In cases in which the whole skin has been destroyed, care must be taken to avoid scar contraction. The area, after treatment, should be splinted, and early skin grafting done, especially when there is a joint involved. After cleansing, the burn may be covered by *tulle gras* to which sulphonamide powder has been added, and firm pressure applied by wool and bandage. Should no signs of sepsis develop, this dressing may be left for 4 or 5 days. Ambrine wax is sometimes used instead; the wax is melted, and run into the wound on to a layer of sterile gauze.

This treatment is of great value in cases in which extensive destruction has occurred; the dressing should be left untouched for several days.

When extensive sloughing has occurred, a eusol dressing should be substituted until the sloughs separate, and watch should be kept for secondary haemorrhage.

A burned limb is best treated by the Bunyan-Stannard envelope (see Figs. 2 and 3). This should be longer than the limb it covers and adequately held in place by a strapping cuff. At stated intervals, a solution of "Milton" (1 in 20, at a temperature of 100°F.) is run through the inlet valve into the envelope and over the wound, and is drained away at the outlet. These openings may be clamped between treatments, and a splint may be fixed outside the envelope when deformity is feared. This method mini-



FIG. 2.—BUNYAN-STANNARD ENVELOPE AS APPLIED TO THE KNEE.

(By courtesy of Irrigation Envelopes Ltd., London, W. 1.)

mizes the danger of secondary infection, avoids disturbance of granulation tissue and allows freedom of movement for fingers or toes while the envelope is filled with fluid.

Scalding of the mouth and larynx by inhalation of steam from a kettle may necessitate tracheotomy. The patient, usually a child, should be nursed in a steam tent. A little white "Vaseline" may be applied to the lips and chin, small sips of demulcent fluid frequently given or rectal feeding resorted to. A careful watch should be kept on the breathing and the pulse rate.

Frostbite.—This condition affects the extremities, which are the most poorly supplied with blood. The hands, feet, ears or tip of the nose are most usually involved. It may result from direct application of cold, causing local gangrene, or from inflammatory

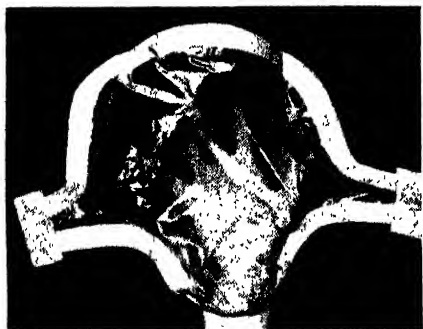


FIG. 3.—BUNYAN-STANNARD ENVELOPE
USED FOR BURN OF HAND.

(By courtesy of Irrigation Envelopes Ltd., London, W.1.)

tory exudate choking the blood vessels locally as the part thaws. The patient should be kept well away from the fire and hot water; the affected part should be lightly covered with cotton wool and kept raised, and the patient's general condition should be treated by hot drinks and rest. Tight clothing, by obstructing the blood supply, predisposes to the condition. (See also Vol. I, p. 339.)

Chilblains.—Chilblains (erythema pernio) are mild forms of frostbite, the itch and heat being due to the gradual swelling round the terminal vessels of the part. They are sometimes associated with poor calcium supply, and therefore calcium lactate and extract of parathyroid have been given. Relief may be obtained by applying locally, with a pledget of cotton wool, a mixture of 50 per cent hydrogen peroxide (10 vols.) in warm sterile water, the bathing being continued for 15 minutes.

Ulceration

An ulcer is a form of necrosis, or death, of a limited part of the tissues. In a burn, there is a dead centrum which is cast off as a slough, the latter being necrosed tissue in the mass; a shallow cavity is left which is very much akin to the ulcer. The classical ulcer however loses its cells one by one and slowly progresses to its maximum by a process of imperceptible stages of degeneration

of mucous membrane or skin which has had origin in some surface inflammatory point.

Causes.—In the first place ulcers may be classified according to the causative agent, and 3 great groups are distinguished as follows: 1. non-specific, the result of irritation by bacteria, injury, chemical substances or physical conditions, including heat, cold and pressure; 2. specific, generally the result of tuberculosis or syphilis; 3. malignant, including rodent ulcer and cancerous ulcers.

General causes of ulceration are weakened constitution from long-standing illnesses, general debility, poor nerve supply, chronic congestion and diabetes.

Symptoms and Signs.—First it is necessary to study the course of an ulcer. It usually goes through 3 processes as follows.

1. *Extension or Spreading.*—This corresponds to the formation of a gradually widening cavity. The edges are clean-cut; there is a slough on the surface; and a discharge, sometimes blood-stained, but usually thin and evil-smelling, is present. There is congestion and oedema for about $\frac{1}{2}$ inch all round and the base of the ulcer is firmly fixed to the tissue below. No granulations are seen.

2. *Granulation.*—This marks the turning point. An effort is obviously being made now to limit the extension. Granulation is the forerunner of the healing stage. The slough is cast off, and below is found a certain amount of soft fibrinous tissue, which contains many healing cells. Ultimately granulation tissue is produced, consisting of active-looking tissue with minute red points showing the development of new blood vessels.

3. *Healing or Repair.*—The ulcer is now definitely on the mend. The pain is slight, the discharge is scanty and the oedema is replaced by healthy skin, which is obviously growing in towards the centre of the ulcer. The base appears to be rising slowly to the surface, the granulations being active and healthy. A well-marked bluish ring marks the encroaching circle of new skin, which has shelving edges. Ultimately the granulations are covered by a fibrous cicatricial layer over which the skin forms the final healed layer.

Types of Ulcer.—In the second stage, or on account of specific causes, ulcers may show certain peculiarities.

Callous or chronic ulcer is caused by congestion, lack of rest, long continued pressure and the existence of a base which is firmly adherent to the structures below. It frequently recurs, especially if it is situated in the midst of a large cicatricial area. It is a deep ulcer, with a hard base, no granulations, a light-yellow surface and a thin discharge. Irritable ulcer is similar to the above; its surface is glossy, and it is tender owing to exposed

nerve endings. It may end as a painful scar. Varicose ulcer is very common, especially on the leg. It is liable to occur if the slightest abrasion or injury is sustained when there is an advanced condition of varicose veins. It tends to become callous when it is not vigorously treated. Many varicose ulcers run their course for years and fluctuate in size, but they are commonly the size of a crown piece, on the inner side of the calf of the leg, and a bane to the sufferer, usually a woman of 50 to 60 years of age. Specific ulcers may be found in syphilis, as the primary chancre, the secondary ulcer and the tertiary ulcer, all of which have been already described; the tuberculous ulcer and the ulcer of anthrax (malignant pustule) are also examples. Malignant ulcers run quite a distinct course of their own, the malignant nodule eroding the skin. The commonest example is the rodent ulcer, which may cause an unsightly excavation of the skin and lead to great disfigurement.

Treatment.—In the stage of extension, the part should be raised and put at rest. Eusol dressings or fomentations may be used at first until the sloughs have separated. When the healing stage commences, sulphonamide powder may be dusted over the surface and a "Vaseline" gauze dressing with pressure bandage may be applied; this can be left for several days. Saline or flavine dressings may be used in mild cases. In cases in which granulation is slow, lotio rubra, applied only to the raw area, may hasten repair; should granulations rise above the skin surface, they may be cut away, cauterized by a silver nitrate stick. In extensive ulcers skin grafting may be necessary.

A chronic ulcer of the leg may benefit by a "Viscopaste" bandage. The limb is raised, a piece of medicated felt, cut to shape, is placed over the ulcer, and the bandage firmly applied from the knee to the toes¹, giving firm support at the heel. This bandage may be left on for 4 to 6 weeks; should discharge seep through, a sterile dressing is placed over the moist area. A similar effect may be produced by the use of Unna's paste (a mixture of ichthyol, zinc oxide, gelatin, glycerine and water). The jar is placed in warm water until the paste melts, after which the paste is painted over the affected area on the folds of a sterile cotton bandage. When varicose veins are present, injection or ligation of the diseased vein speeds repair.

Bed sore.—This form of ulceration is fully dealt with in Vol. II, pp. 309 to 312.

¹ The more orthodox method "toes to knee" helps venous return, but by applying from knee to toes rucking of the bandage is obviated when the stocking is removed; each method has its advocates.

CHAPTER 4

INJURIES, FRACTURES AND DISLOCATIONS

INJURIES. CONTUSION. HAEMATOMA. OPEN WOUNDS. INCISED WOUNDS. LACERATED WOUNDS. PUNCTURED WOUNDS. GENERAL TREATMENT OF WOUNDS. INFECTED WOUNDS. SKIN GRAFTING. HOW A WOUND HEALS. GANGRENE. FRACTURES. HOW REPAIR TAKES PLACE. TREATMENT. COMPOUND FRACTURE. COMPLICATIONS. MODERN VIEWS ON FRACTURE TREATMENT. SPECIAL FRACTURES. BONES OF THE FACE. SKULL. RIBS. CLAVICLE. HUMERUS. ULNA. RADIUS. FINGERS. SPINE. PELVIS. FEMUR. PATELLA. TIBIA AND FIBULA. DISLOCATIONS. SPECIAL PLASTER CASTS. COLLES'S FRACTURE. SUGAR TONGS SPLINT. PLASTER OF PARIS SPICA OF SHOULDER. HIP SPICA. CONGENITAL DISLOCATION OF HIP. IMMOBILIZATION OF CERVICAL SPINE. IMMOBILIZATION OF LUMBAR AND DORSAL VERTEBRAE. TOBRUK PLASTER.

As already emphasized, first aid is a method of treatment quite distinct from that which is provided by hospitals or in the doctor's consulting room. In this chapter orthodox treatment of injuries, fractures and dislocations is dealt with and although it is obviously necessary to refer to first aid (Vol. I, pp. 307-356) it may well be left in its own category.

Injuries

Contusion.—Wounds are the result of some break in the continuity of the skin or mucous membrane but the underlying tissues may be injured without an external wound e.g. in the contusion which is the result of some vigorous or violent blow on any part of the body; the elastic skin may not rupture, but in the softer tissues below, the various blood vessels burst and fill the cellular interspaces with blood, thus forming the typical bruise. Common examples are the "black eye," which shows first the purple-black coloration, then passes through a green and yellow stage until the skin is normal. The same condition may be found in the vulva or scrotum. It is evidence of the gradual change and absorption of the blood pigment.

Haematoma.—When a large artery or vein is burst, the skin or mucous membrane remaining intact, there is naturally a rush of blood which stops only when held up by clotting and its own pressure. Firm round swellings are therefore created and they show a fluctuating content. They are really blood cysts, and to them we give the name, haematoma. They may become absorbed completely in time but generally some fibrosis occurs; or the cyst may persist as a sterile hollow tumour containing clear fluid. In the last case there is always a danger of suppuration. The treatment is generally that of complete rest, with a soothing or ice-cold lotion applied at once. When the swelling begins to develop into a state of fibrosis, it may be broken up by expert massage. Rarely does the cyst require to be punctured and drained.

Open Wounds

The classification of open wounds has already been mentioned. Any wound may become complicated by infection; indeed sepsis is the great bogey of all accidental injuries.

Incised Wounds.—Since these are clean cut, the haemorrhage is difficult to stop. Even when the first-aid treatment has apparently stopped the bleeding, there may be need to make sure that the main vessels are tied. All operation wounds are incised wounds.

Lacerated Wounds.—These are nearly always also contused, and the whole lesion is ragged and disorganized—a perfect situation for a bacterial invasion. Owing to the crushing of the vessels, the twisting of the tissues and the ragged edges of the wound, bleeding stops more easily, but healing is likely to be very much affected by complications such as sepsis and secondary haemorrhage. Most of the wounds resulting from the missiles of modern warfare are lacerated. Very rarely do we find the through-and-through wound of the high-velocity bullet.

Punctured Wounds.—In stabbing, especially with a thin, finely tapered weapon, the wound may be so small that the entrance is difficult to find. The depth may be several inches, however, and vital structures such as the heart, lungs and intestines may be punctured. In certain textile industries punctured wounds of the fingers with needles or hackles occur and show little or no sign of injury, but may become very septic and lead to loss of a finger or even of the hand.

General Treatment of Wounds.—We must now put aside for the time being the first-aid methods learned in Section II. How does the surgeon deal with the average wound? The answer to this is that there are almost as many methods as there are

surgeons. Each injury must be treated on its merits and having regard to all the circumstances of the case. The following methods may be taken as the basic principles of all wound treatment.

The patient is placed in a warm bed and treated for shock. Watch is kept on the first-aid dressing and the pulse, in view of the possibility of recurrent haemorrhage. Antitetanic serum, 1,000 units, may be given prophylactically in road injuries, but extensive muscle damage will also demand administration of anti-gas gangrene serum. A course of penicillin may be commenced if there is much soiling of the wound. Within 8 hours the patient should be taken to the theatre and an anaesthetic administered and the wound attended to. All dead tissue should be cut away, fascial planes opened up and blood vessels ligated or closed by torsion or cautery. Saline should be used for gentle cleansing of the wound, then, when the latter is clean, sulphonamide or penicillin powder should be sprayed over it. The surrounding skin should be cleansed by alcohol and shaved if necessary. Strong antiseptics and vigorous scrubbing delay healing by damaging the tissues.

The edges of a clean wound may then be drawn together by silkworm gut, nylon or horsehair sutures. Some surgeons prefer to use metal clips (Michel's) while others use silk or black cotton. If sepsis should be feared, a small rubber tube, glove drain or gauze wick may be placed in the dependent part of the wound; alternatively secondary suture may be resorted to, in which case deep stitches are placed in position and tied after 48 hours.

Punctured wounds require to be opened up and well cleansed. Anaerobic bacteria thrive if implanted at the bottom of these wounds and there is little outlet should sepsis occur. An extensive lacerated wound is in many cases covered by *tulle gras* or by gauze and soft paraffin, and a pressure dressing or plaster cast applied; in other cases immediate skin grafting may be attempted.

In cases in which the skin edges are sutured the skin is painted with a mild antiseptic and protected from contamination either by a layer of sterile gauze wool and bandage, by gauze and strapping or by collodion. These dressings need not be disturbed until the sutures are removed. All after-dressings are reduced to the minimum to prevent secondary infection and destruction of granulation tissue, reliance being placed on the raising of the patient's resistance to hasten repair. Thus blood transfusion, chemotherapy, diet and sedatives all play an important part in local recovery.

Infected Wounds.—Sometimes despite the most scrupulous care, infection occurs. The pulse rate increases, the wound becomes hot, red and painful. General treatment is instituted: massive doses of the appropriate antibiotic are administered and pain is controlled, and sleep induced by drugs.

Locally the wound may be opened up to establish free drainage and infra-red ray or radiant heat may be utilized to increase the blood supply to the part. Moist heat, such as poultice, fomentation or local bath, is rarely used today but still has a useful part to play in special cases. Irrigation by Milton solution or saline solution may be used to remove discharges, and should a slough form dressings of eusol may be ordered or

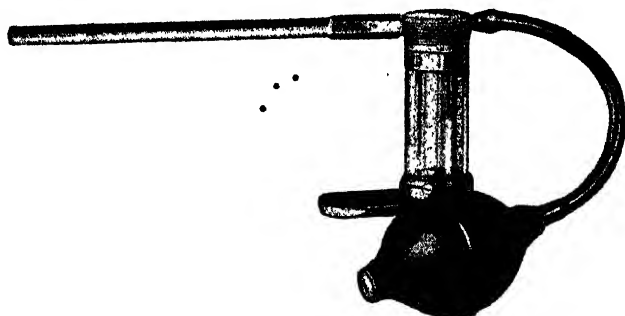


FIG. 4.—PENICILLIN POWDER INSUFFLATOR.
(By courtesy of Messrs. Chas. F. Thackray, Ltd., Leeds.)

hygroscopic dressings of hypertonic saline, magnesium sulphate or glycerine may be used to increase the exudation of lymph.

Skin Grafting.—In cases in which there is extensive and complete skin loss, early grafting will hasten recovery and prevent scar formation. There are 3 methods as indicated below.

1. *Reverdin's Method.*—On the raw area are planted tiny islands of new skin, obtained by raising a piece of healthy skin on a needle and snipping it off with a pair of sharp scissors.



FIG. 5.—EYELSS SUTURE
NEEDLE, CURVED TYPE.
(By courtesy of Messrs. Chas. F.
Thackray, Ltd., Leeds.)

Thiersch's or Split-skin Graft.—A thin layer of skin is cut off with a sharp razor or dermatome and placed in apposition with the raw area. In both these cases the wound must be free from bacteria and should be dressed with normal saline for 12 hours prior to the application of the graft. The area from which the graft is taken should be cleansed and painted with spirit for 2 days, then a saline compress should be applied the night before the grafting. After the graft has been applied a layer of "Vaseline" gauze is placed over it and firm pressure applied by Stent cast, or by gauze, wool and *crêpe* bandage. The pressure is necessary to prevent lymph from collecting between the wound and the new skin; it is an essential part of the treatment. Antiseptics are

not used; the wound is left untouched for 10 days by which time the grafts should be firmly attached.

3. *Pedicle Grafts*.—In this method, if, say, a portion of the thigh skin is to be grafted to the wrist, the skin from the former is raised together with its superficial fascia and the flap is either transferred at once, or more frequently left with a pedicle attached to the thigh. After about a week the pedicle can be cut, the skin on the wrist trimmed and the thigh wound sutured.

How a Wound Heals.—When a wound is closed with sutures and, after a preliminary inflammation compatible with the healing tissue reaction, becomes marked only by a faint red line, we say that healing has been accomplished by first intention. This is the consummation devoutly to be wished by all surgeons. It is the hall mark of asepsis, and after a fortnight the union is firm and strong and for all ordinary purposes the part is as good as ever. All first intention wounds give off a clear but scanty discharge of serum tinged with red during the first 2 days, but this dries up very quickly.

In many cases, however, the healing does not occur by first intention. For instance there may be laceration and destruction of the tissues, or sepsis or some condition which prevents the bringing together of 2 surfaces and the subsequent adhesion. The surfaces are kept apart until a certain natural process of healing by second intention is allowed to occur; this takes time, and there is a constant routine in the events. The fundamental action is the formation of granulation tissue, which has already been referred to in passing.

Let us suppose that we are dealing with one of the numerous open wounds of modern life, perhaps the result of a serious motor accident. It has been trimmed and cleaned and protected against sepsis by antibiotics and it has reached a stage at which it is ready to mend. The first thing that happens is that the whole raw area is invaded by leucocytes and plasma from the blood; these give the final cleansing to the tissues, shutting off the dead protoplasm in the form of sloughs, and making way for a type of cell called the fibroblast, which appears in thousands and which forms a fine network of fibrous tissue over the base of the wound, just as any roadway is set with steel lines for the cement which is later moulded on them. At the same time the capillaries begin to put out small buds, and very soon the base of the wound and its shelving edges are covered with layers of fibrous tissue and very delicate red points which bleed even when lightly touched with gauze. The fibrous tissue meanwhile becomes prolific and forms a cicatrix or scar, which contracts and seems to pull the edges of the wound as near to each other as possible. Finally the skin grows over from the edges of the wound and puts the last covering over the scar. It may be very

thin and easily broken, however, and thus there is always some memorial left of the injury which marks the site of the wound. As time goes on, the fibrous cicatricial tissue contracts and may lead to deformity and disability; this is always a serious complication of massive injuries involving a whole limb and operative treatment subsequently may be required.

There is hardly one among us who does not have on his or her skin some evidence of previous wounds, and no matter how small, the pearly-white colour, the thinness of the cuticle and the slight contraction present the same features as do the larger wounds. Healing by granulation may go on under a scab, which is simply a rough and ready protective of blood and serum formed over an abrasion and hardened in its own time; it may also be the means of clearing up a blood clot which has collected in a loose space, as already described. In some cases it may be necessary to keep the edges of the wound apart until there are 2 fields of granulations opposite each other; when the appropriate time comes the surgeon joins the two sides of the wound and the capillaries unite with supporting fibrous tissue to assist them; thus a sound scar is formed.

The dangers of contraction in scars is obvious. Large wounds are often skin-grafted on account of the possibility of permanent fixation at a joint. An interesting type of scar is the keloid, which is the result of excessive and persistently growing fibrous tissue; it is as if the fibroblasts had gone completely out of control and were running wild. No doubt some peculiarity of the patient (frequently tuberculosis is active) accounts for the condition, which sometimes disappears spontaneously or passes off gradually under the influences of x-rays or radium. Now and then it is necessary to dissect an ordinary scar owing to involvement of the nerve endings, the latter causing pain and extreme tenderness. We have already noted that thin scars break down and form ulcers very easily, but a much more serious possibility, though fortunately rare, is malignant degeneration of a scar so that it becomes cancerous.

It should be understood that cicatricial tissue may fill up quite a large space, but if the process of healing goes on equably many of the muscles, parts of bones, nerves and tendons may regenerate and form new structures which aim at, but do not completely succeed in, the formation of a new set of tissues intended to replace those lost by the accident or by subsequent sepsis or repair.

Gangrene

The subject of gangrene may be conveniently dealt with at this point. In an ulcer, the necrosis is a gradual process of

tissue death occurring cell by cell. In the case of the large wound, the slough is a local piece of dead tissue. In gangrene, as generally understood, there is death of a large organized portion of the body, generally a limb. Nevertheless a portion of muscle or a piece of bone may rot (forming a sequestrum), and it is quite proper to refer to the conditions as "gangrenous."

Gangrene usually results from the closure of the nutritive artery to a part. To cut off the blood supply of, say, the leg, for a lengthy period is to deny the limb its food, fuel, and defensive force and the protoplasm thus dies in a mass.

Causes.—The causes of gangrene are easily deduced. If a large artery be cut or seriously injured, the area it supplies is mechanically deprived of blood; much the same thing may happen, although more gradually, when a large scar contracts, involving the main vessels, or when sepsis invades the capillaries and cuts off a large area from its supplies, or when there is obstruction in the main artery. Gangrene may also be caused by diabetes, excessive use of ergot, acute fevers or specific organisms. The last give rise to "gas gangrene."

Symptoms and Signs.—Since the vessel is not in action the pulse is absent. The limb becomes cold, purple at first and then yellowish-white; sensation is lost and the limb is useless for any work.

Varieties.—1. *Dry Gangrene.*—This is the result of occlusion of an artery, the fluid gradually draining from the part and leaving it dry, shrivelled, hard and black. In this type the gangrenous portion rots like any dead tissue separated from the body.

2. *Moist Gangrene.*—In moist gangrene the fluids are left in the part, and form an ideal culture medium for bacteria, so that sepsis of virulent character is the outcome. The rotting is most offensive and may give rise to gases. The part is swollen, purple and rapidly putrescent.

Course of the Disease.—As has already been mentioned it is possible to dispose of small gangrenous areas by leucocytic action. But in gangrene of a limb there is a special area—the line of demarcation—which forms between the dead and the living tissues and in this area there is great activity of the leucocytes, which act as engineers, separating the dead from the living and repairing the stump by cicatricial tissue and granulation. The line of demarcation is less marked in the moist septic cases, for the poisoning tends to spread to the healthy portion and the latter may be involved in a serious inflammation of septic type; this is apt to spread to the whole system and cause general septicæmia. Ultimately the dead limb is cast off by circular

ulceration which deepens until even the bone is separated. The condition is very little different from that of a serious accidental wound which exposes all the tissues. The shock and constitutional reaction are, very grave.

Treatment.—There may be excessive pain above the line of demarcation, therefore an opiate is usually necessary. The general nursing and feeding are similar to that of a severe fever. Special local treatment must be carried out according to the nature of the gangrene or to its cause, but as a rule the gangrenous portion is powdered with boracic acid or painted with spirit and covered with a thin layer of cotton wool. The affected part should be nursed outside the bed, since cold retards the process of decomposition; it should be raised on a pillow to improve venous drainage. Some surgeons surround the affected part with ice. Should blisters form and burst, a frequent change of dressing will be necessary and amputation will have to be resorted to quickly, before secondary infection occurs.

Fractures

The first-aid knowledge of fractures already gained by the nurse who has made a careful study of Vol. I, pp. 324–336, will be of great assistance to her in her ward work. In the following pages the various aspects of fractures are dealt with only from the surgeon's point of view, but many of the first-aid principles apply to the more expert treatment.

Causes.—Apart from the common causes of fracture—direct, indirect and muscular violence—many conditions predispose to fracture. Tumour of the bone, senile decay, scurvy, rickets and locomotor ataxia, by weakening the bone, pave the way to disaster. The bone is likely to snap without warning when subjected to normal strain; the resultant fracture is said to be pathological or spontaneous.

Varieties.—In addition to the types described in Vol. I, pp. 324–336, there is the fracture due to separation of the epiphysis; when force is applied to the long bone of a child or young adult, the cartilage tears and the end is separated completely or partially from the shaft. In an adult this form of trauma would produce a dislocation of the joint. This condition may be a complication of syphilis, tuberculosis, scurvy, acute osteomyelitis or other inflammatory states affecting the epiphysis.

Symptoms and Signs.—Once the patient is in hospital, there need be no doubt about the fracture, therefore the nurse must realize that repetition of all the first-aid tests is quite unnecessary. An x-ray photograph will demonstrate clearly the extent

and nature of the condition and will guide the surgeon in making the most satisfactory repair (Fig. 6). The patient complains of pain at the site of the fracture and of inability to move the part. Swelling and sometimes bruising are present, and some deformity. Shock may be severe, and other important structures may



FIG. 6.—DAMAGE DONE BY FRACTURE OF A BONE.

The x-ray shows angular deformity, partial impaction and interruption of the normal contour of the limb.

be involved. The fracture may extend into a joint, and nerve injury may lead to paralysis. Blood vessels may be torn, causing haemorrhage or they may be obliterated, leading to gangrene. The skin may be damaged, thus opening the path to infection. A slight rise in temperature may be present for some days, and delirium may occur in elderly or alcoholic patients.

How Repair takes Place.—In a simple fracture the two fragments are separated, but the vital periosteum, although lacerated, forms a ragged sleeve over them. Owing to bleeding, a clot is formed which acts as a natural internal dressing and which also functions as a buffer between the fragments, but it is rapidly absorbed by the leucocytes, and in a way akin to that of wound healing, granulation tissue takes its place. This is reinforced by similar tissue which is generated by the periosteum, and the whole injured portion is plastered together by dense material, which, becoming impregnated with a supply of calcium from the bone cells, gradually develops into the hard framework of regenerating bone called callus. There is considerable thickening, and the join becomes very firm as more and more bone is laid down. Callus is fully developed in 14 to 21 days, and in the absence of complications stout new bone is established in about 2 months. But everything depends upon the factors governing

the injury, which, when it is a compound fracture, involves the introduction of many complications which affect the normal course of healing and demand special measures of treatment. In time the callus is absorbed, leaving only the permanent bone.

Treatment.—In hospital, treatment aims at reduction of the deformity, immobilization of the damaged area, prevention of wasting in the tendons and muscles involved and stimulation of repair. Throughout, progress is checked by frequent x-ray examinations.

1. *Reduction.*—After treatment for shock, and preliminary radiographical examination, the bone ends are gently brought into apposition. A general, regional or local anaesthetic may be necessary to overcome the muscle spasm and the fracture is reduced by manipulation. When large muscles are affected, the spasm may be overcome by prolonged traction effected by weight extension. In cases in which soft tissues lie between the ends of the bone, open operation is necessary.

2. *Fixation.*—Plaster of paris is commonly used. The cast may be padded or unpadded; it is lighter, gives better support and allows earlier movement than ordinary splints. Kirschner wire may be incorporated in the plaster when over-riding is feared. Prolonged extension by skeletal pin or strapping extension may be used to immobilize a fracture of the femur. Open reduction and the use of wire, or bone pin, may be necessary in special cases.

3. *Maintenance of function in the soft parts.*—The muscles and tendons involved must be exercised, otherwise atrophy will occur, adhesions will form, the circulation will be restricted and healing will be delayed. At first the patient is told to imagine he is moving the part, then massage and active movements under the supervision of a qualified physiotherapist are allowed locally. As soon as possible the patient is encouraged to use the limb.

4. *Stimulation of repair.*—Use and massage improve the blood supply and encourage lymphatic drainage. Calcium in the form of cheese or milk should be given in the diet, with vitamins C and D. Extra fluid should be taken to prevent stone formation in the kidney and to encourage bowel action. Tonics and sunshine are helpful as they stimulate metabolism. Of first importance is the mental attitude, and occupational and remedial therapy play an ever greater part in the treatment.

Compound Fracture.—The great danger here is sepsis. All dead tissue is carefully removed when the fracture is reduced. A small tube may be inserted leading to the bone surface, and

penicillin solution passed through it at 3-hourly intervals for the first few days; or the skin edges may be drawn together and *tulle gras* dressing applied. Some surgeons encase the limb in plaster of paris, following the example of Trueta, whereas others make provision for a daily dressing. In all cases a course of the appropriate antibiotic or sulphonamide is started and a prophylactic dose of antitetanus serum is given.

Complications.—In all fractures there is a danger of hypostatic pneumonia, especially in senile patients. Bedsores must be guarded against. Fat embolus sometimes occurs when long bones are involved. Delirium tremens rarely occurs today, but gangrene may develop when a large vessel is involved, or gas gangrene when damaged muscle is invaded by *Clostridium welchii*. Paralysis may be due to the tearing of a nerve, or by pressure on it from callus, splint or crutch. Infection must be guarded against in cases in which the fracture is compound; and non-union, mal-union, or false joint formation should be prevented. In early treatment of simple fractures, the nurse should be particularly careful not to convert a simple fracture into a compound fracture by careless handling or by over-keenness to find out what is wrong. The manipulation of newly admitted cases of fracture should be carried out on the most conservative lines.

Modern Views on Fracture Treatment.—Especially with regard to fractures of the bones of the lower limb, there has been a good deal of controversy regarding the advisability of free early use of the limb. Today confinement to bed is reduced to the minimum; for fractures below the knee a plaster cast is applied, fitted with a Böhler walking iron or rubber heel, and weight-bearing is allowed. Simple fracture of the spine immobilized in hyperextension by a plaster jacket allows for early ambulatory treatment, and it is agreed that in fractures of long bones, the neighbouring joints should be exercised, assuming that the fragments are not disturbed and that there is no risk of interference with the process of good bony union. Some authorities say that the joint must be kept immobilized but the best opinions seem to be against this procedure. The method of skeletal traction is undoubtedly of established use, and it is likely to be adhered to, because it is painless, the force is applied at the bone, great pulling power can be applied, the joints are freely mobile, massage is possible from a very early date and in compound fractures the dressings are very easily carried out. The method consists of attaching a stout wire to a stirrup which is connected to a pin driven through the bone, either at the condyles of the femur, at the head of the tibia or at the calcaneum. In skilled hands this type of treatment is most successful. (See also Vol. III, pp. 2, 3 and the subsequent pages of this chapter.)

Special Fractures

A good first-aid knowledge of the main features of the commoner fractures may now be supplemented by certain of the more technical points connected with fractures of individual bones.

Bones of the Face.—Fracture of the mandible is nearly always compound, owing to the proximity of the mouth. Scrupulous care is needed in the toilet of the mouth; all feeds should be given from a spouted feeder, and should be followed by application of water, or irrigation of the mouth by a mild antiseptic. Immobilization is secured by wiring the lower to the upper jaw, after a tooth has been removed in order to make a channel for feeding purposes. As a temporary measure a barrel bandage may be used.

Nasal bones are sometimes fractured by direct violence, pain and epistaxis being present. Early and accurate setting with the application of a moulded splint is advisable, since the fragments unite quickly.

Skull.—Damage to the vault is usually produced by a heavy blow. The fracture may be compound or the inner table may be pressed down on the underlying brain—depressed fracture. Injury to the parietal region may tear the middle meningeal artery, the resultant haemorrhage causing compression of the brain. Fracture of the base may lead to a discharge of blood or cerebrospinal fluid by the ear or nose; paralysis of the face or eyes may occur; blood may escape into the orbit or tissues of the neck. There is always some damage to the brain.

Treatment.—There is need for rest in the recumbent position, with anti-shock treatment for the initial concussion. The pulse rate should be recorded at $\frac{1}{2}$ -hourly intervals, and careful watch kept for vomiting, with signs of returning consciousness; any deepening of the coma, with slowing of the pulse rate, is evidence of cerebral compression. So far as the latter is concerned it may be due to a depressed fracture or to the formation of a blood clot, in which cases early trephining of the skull and treatment of the cause will be necessary. In other cases it is due to oedema of the brain. A magnesium sulphate enema may be ordered ($12\frac{1}{2}$ per cent strength), and an icebag may be applied to the head. A restless patient can be placed in Fowler's position to improve the venous return from the skull. The patient may be fed by rectum or by stomach tube if unconsciousness be prolonged. Attention to mouth and pressure areas is important, and retention of urine should be watched for. A long convalescence is necessary to prevent the unpleasant sequelae of headache and giddiness. Discharge of cerebrospinal fluid from the ear should be treated aseptically, otherwise meningitis may occur.

Ribs.—The signs have been fully described in Vol. I, p. 330. The hospital treatment consists of the application of overlapping strips of adhesive plaster which encircle the whole chest. They must be non-elastic, must extend from the lower costal margin to the axilla and must be put on during full expiration. The strapping should be covered by a domette bandage and left on for 3 weeks. The patient should be got up as soon as possible, a watch being kept for pleurisy. When lung involvement is feared strapping is not used; repeated local injections of novocaine should be given to relieve the pain and the patient should be kept in bed. Frequent movement and inhalations of carbon dioxide help to prevent pneumonia.

Clavicle.—This may be fractured at three main points viz. greater convexity, acromial end and sternal end. In very bad

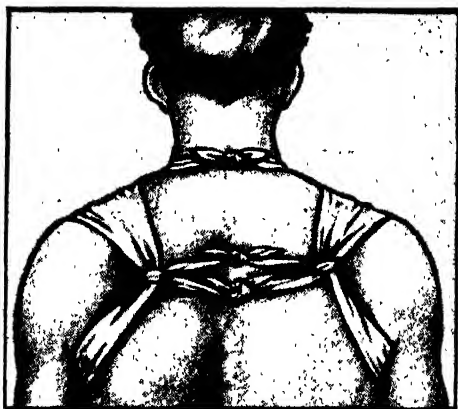


FIG. 7.—3-SLING METHOD OF TREATING FRACTURED CLAVICLE.

cases the brachial plexus may be injured with resultant paralysis of the arm. The fragments may be kept in position by the 3-sling method (Fig. 7). Two bandage rolls are placed round the shoulders and tightened by a third which is threaded through them. The hand on the affected side may be supported by a sling. A figure-of-eight bandage is sometimes applied, or prolonged recumbence with a sandbag between the shoulders may be resorted to. Sayre's method of fixation by strapping is rarely resorted to because of its discomfort.

Humerus.—If fracture should occur within the shoulder joint (anatomical neck) shortening is slight; there is loss of movement and bruising. The head may be removed if it be lying free or it

may be pegged. In simple cases application of a sling and early movement is sufficient. There is much callus formation and a danger of arthritis.

Fracture of the surgical neck produces much shortening and there is a danger of paralysis of the deltoid muscle. Traction in abduction for a time should be followed by application of a Cramer wire support. A fracture of the shaft may damage the radial nerve and lead to wrist drop; it is difficult to immobilize, and the limb may be supported on an abduction frame or by plaster for 5 or 6 weeks. A supracondylar fracture, or a separation of the lower epiphysis, may be immobilized in flexion for 2 or 3 weeks, a collar and cuff sling supporting the wrist. Ischaemic contracture may occur, and careful watch should be kept on the radial pulse and on the circulation in the fingers.

Ulna.—The common features are those of the olecranon, the coronoid process, the styloid process and the shaft. In the case of the first, the fragment is pulled up by the powerful triceps. A fracture of the olecranon should be treated by wiring or by excision. Active movements under supervision may be started after 10 days.

Radius.—Fracture of the head, if simple, is treated by immobilization of the elbow in flexion; if comminuted the head is first excised. Active movements are permitted after 14 days. Fractures of the shaft are treated by application of a plaster cast, the elbow being fixed in flexion, with the forearm supinated.

Colles's Fracture.—This is an impacted fracture of the lower end of the radius, a "dinner fork" deformity being produced. After disimpaction, the hand and forearm are encased in plaster from the knuckles to the elbow, the thumb being left free and the wrist slightly flexed. Free movement of the fingers, elbow and shoulder is encouraged.

Fingers.—Fractures of the fingers may be treated by extension on a banjo splint, or immobilized by Cramer wire or plaster.

Spine.—Fractures of the spine may be caused by direct violence or indirectly by a fall from a height. The danger of damage to the spinal cord must always be borne in mind. An uncomplicated fracture when spasm of the muscles has been overcome by traction, is treated by hyperextension and immobilization in a plaster jacket. The patient is then taught to walk and graduated exercises to maintain the efficiency of the surrounding muscles are given. The complicated case may be nursed in a plaster bed or on a divided mattress supported by fracture boards. When paraplegia is present treatment must aim at preventing contractures and pressure sores. Retention of urine may occur and tidal

drainage may be necessary. Cystitis may be a complication, and distension of the abdomen may necessitate the passage of a flatus tube. The bowels can be regulated by gentle laxatives. Haemorrhage into the spinal canal, causing pressure on the cord, will require to be treated by decompression, effected by laminectomy.

Pelvis.—Simple fracture may be treated by support in a pelvic sling. This is made from a roller towel which passes under the pelvis and is supported by a cord leading over the pulley of a Balkan frame to a bag of weights. In cases in which the acetabulum is involved extension of the leg on the affected side may be necessary; a plaster bed is sometimes used. Involvement of the bladder or urethra may require operative treatment. Early active movements of the legs and back are encouraged; 6-10 weeks recumbency will be needed.

Femur.—Intracapsular fracture involving the neck of the femur is common in elderly people. Rarely today do we have to resort to immobilization between sandbags or encasement in the heavy Whitman's plaster spica. Extension is necessary in some cases, but in most the insertion of a Smith-Petersen pin (Fig. 8) shortens the bed treatment from 6 months to 3 months, or in



FIG. 8.—SMITH-PETERSEN PIN.

(By courtesy of Messrs Chas. F. Thackray, Ltd., Leeds.)

selected cases to 6 weeks. The pin is introduced along a special guide; it forms an adequate support or new neck. The limb is then placed in a Thomas's splint for 10 days, or the knee is supported by a sling. Graduated active exercises are then commenced, and the patient is encouraged to move about in bed. Fitting of a caliper is necessary before walking is attempted.

An intertrochanteric fracture may be treated by open operation and plating, or by well-leg traction. The latter treatment fixes both legs (which are first encased in plaster) to a special frame (see Fig. 9) making a parallelogram, the pelvis forming the 4th side. By means of a screw, pressure on the sound limb causes tilting of the pelvis and traction on the injured limb. The patient may sit up in bed or be lifted into a wheel chair. The apparatus should be worn for 12 weeks, but any complaint of pain or pressure must be reported immediately to the surgeon.

Fracture of the shaft may be treated by skeletal traction, in which case a Kirschner wire or Steinmann's pin (Fig. 12) is passed through the bone, and attached by a suitable stirrup to a bag of weights hanging by a cord which passes over a pulley;

other methods are by strapping extension or introduction of a medullary pin. The last greatly reduces the length of stay in hospital. After reduction of the fracture a Kuntschner nail (Fig. 11) is introduced above the great trochanter, and guided into the medullary canal, passing beyond the site of the fracture. A

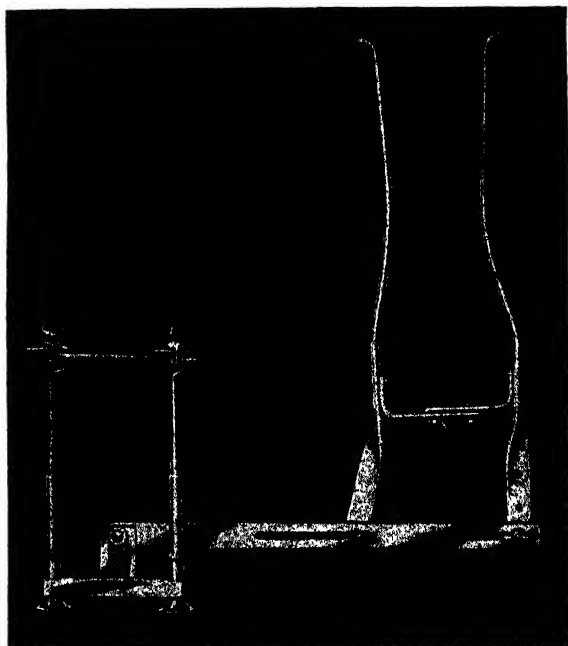


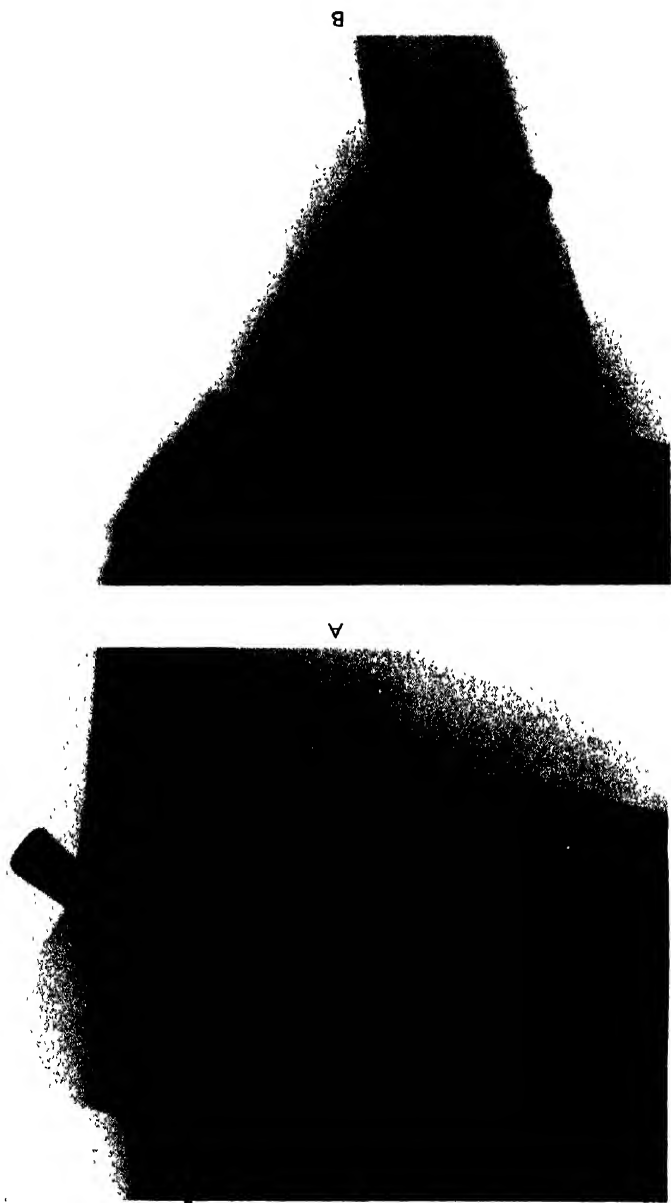
FIG. 9.—LONDON HIP SPLINT USED IN FRACTURES OF SURGICAL NECK OF THE FEMUR.

(By courtesy of the London Splint Co., London, W.1.)

tendency to oedema in the limb should be controlled by a firmly applied *crêpe* bandage. The patient is allowed up after 10 days, but weight-bearing is not permitted. The pin may be removed after 3 months, when repair is complete.

Fractures in Young Children.—A fracture in a young child is usually controlled by applying strapping to both legs, and attaching the strapping to a bag of weights by means of a cord passing over a pulley above the child's body. This raises the child's buttocks from the bed, making sanitary care easier, and utilizing the body weight for counter traction (Gallows extension; see Vol. III, p. 5). A Bryant's frame is sometimes used (Vol. II, p. 415). A T-shaped fracture of the lower end of the femur divides the condyles and causes a break just above.

FIG. 10 A AND B.—SMITH-PIETRSKY PIN IN POSITION IN FILM-CL.
(X-ray films kindly lent by Mr. G. A. Bagot-Watkins.)



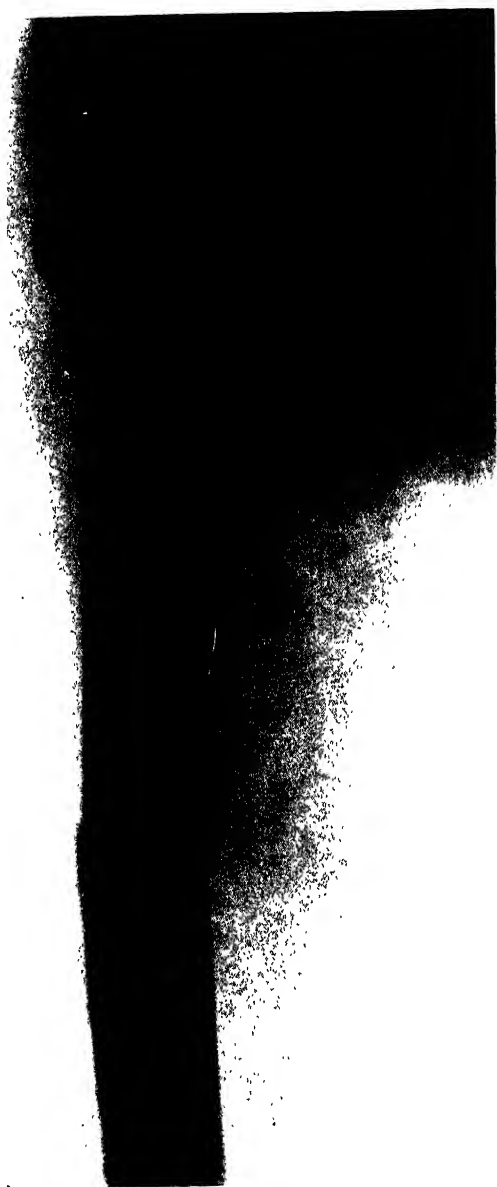


FIG. 11.—KUNTSCHNER NAIL IN POSITION IN A FRACTURED FEMUR.

(X-ray film kindly lent by Mr. G. A. Bagot Walters.)

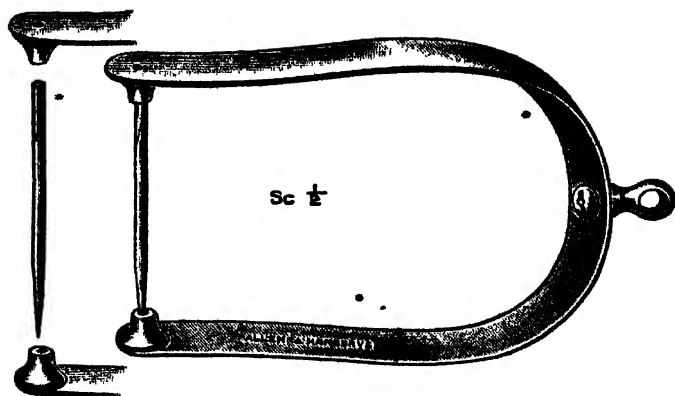


FIG. 12.—STEINMANN'S PIN WITH MAX PAGE STIRRUP.
(By courtesy of Messrs. Allen and Hanburys, Ltd., London.)

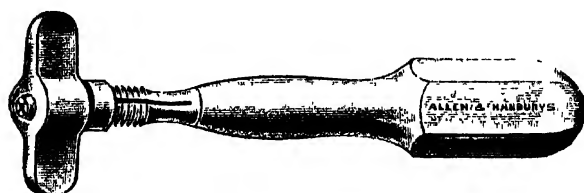


FIG. 13.—HANDLE FOR INSERTION OF
STEINMANN'S PIN (MAX PAGE'S).
(By courtesy of Messrs. Allen and Hanburys, Ltd., London.)

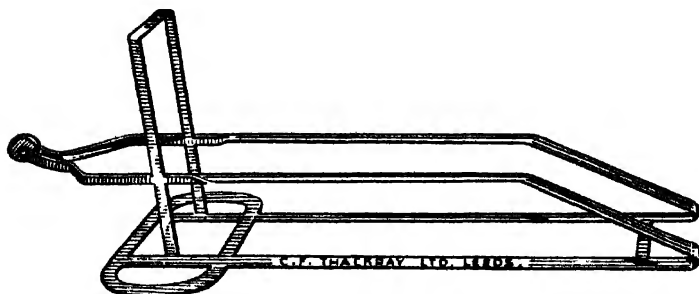


FIG. 14.—BÖHLER'S EXTENSION FRAME FOR LEG (CRADLE
BED SPLINT).
(By courtesy of Messrs. Chas. F. Thackray, Ltd., Leeds.)

The only treatment of use in this condition is open operation with pegging.

Patella.—As a general rule, fracture of this is caused by the strong muscular action of the quadriceps femoris. The symptoms have already been described. The bone should be wired, the operation being conducted with strict asepsis and great care in order to prevent septic arthritis. Early massage and passive movements are indicated.

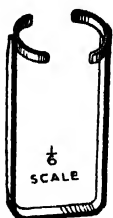


FIG. 15.—BÖHLER'S WALKING IRON.

(By courtesy of Messrs. Chas. F. Thackray, Ltd., Leeds.)

Tibia and Fibula.—Since fracture of one bone is usually accompanied by damage to the other, both may be taken together. The commonest fracture of the shafts is one at the junction of the middle and lower third of the tibia, while the fibula break occurs a little higher up.

The fracture is very often a compound one. Treatment can be applied in several ways, the reduction being first effected under anaesthesia and the limb flexed at hip and knee. A plaster cast is then applied in simple cases and when dry is fitted with a Böhler walking iron (Fig. 15). The patient is then encouraged to use the limb.

A sliding fracture can be controlled by first passing a Kirschner wire through the upper fragment and incorporating it in the plaster to prevent over-riding. In cases in which extension is necessary, skeletal traction by a wire passed through the calcaneum is best, the leg being placed in a Braun's frame (Fig. 16) or slung in a Thomas's splint from a Balkan beam.

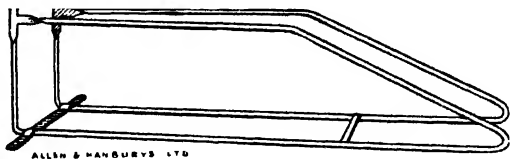


FIG. 16.—BRAUN'S CRADLE BED SPLINT.

(By courtesy of Messrs. Allen and Hanburys, Ltd.)

Pott's fracture is one of the commonest accidents known. Three things happen. First the fibula is fractured about 3½ inches above the ankle joint; secondly the deltoid ligament is torn, often with the tip of the medial malleolus attached; and thirdly there is dislocation of the foot laterally and backwards. Under an anaesthetic, the deformity is adjusted by traction;

great swelling is present. After reduction the limb may be supported on a moulded plaster slab, the plaster being completed when the swelling subsides, or a Macintyre's splint may be used for a few days before a walking plaster is applied.

Dislocations

When the joints are naturally lax, a mild form of dislocation may occur, this being known as a subluxation. Generally, however, dislocation is due to direct or indirect violence and nearly always causes a tear of the capsular ligament. In certain cases children are born with congenital dislocation, particularly of the hip, while disease of a joint may cause a pathological dislocation. Dislocation is often accompanied by fracture as we have already learned.

The signs of traumatic dislocation are those of the altered position of the bones concerned. General swelling, with pain and stiffness, apparent increase in the length of the limb and the obvious change in the contour of the joint are typical. When the primary swelling goes down we are enabled to see clearly that the head of the bone is causing a swelling at an unusual position, while at its usual site there is a hollowing.

The commonest dislocation is that of the shoulder. A fall on the outstretched hand may cause this, or a violent wrench. The head of the bone passes through the capsular ligament and may be found lying under the coracoid process or behind the glenoid cavity. It is not difficult to make out the flattened shoulder, the bulge outside the region of the joint and the jutting out of the elbow. A nurse should never attempt to reduce any dislocation. Manipulative surgery (not to be confused with the much discussed osteopathy) is now a prominent branch of surgery, and it must be left to the expert to perform the appropriate treatment. No harm can be done in getting the patient ready by exposing the upper part of the body, taking care not to disturb the injured shoulder; cold water cloths may be applied locally and a broad sling put on to support the elbow. In most cases, the surgeon will give an anaesthetic and will then reduce the dislocation according to one of the various methods in vogue. After-treatment consists in the wearing of a sling, massage from the first day and making no attempt to raise the arm to shoulder level for 14 days. Repeated dislocation may necessitate operative treatment, a piece of muscle being transplanted to strengthen the weak place in the capsule.

Dislocation of the medial semilunar cartilage in the knee is accompanied by pain owing to the "nipping" of the cartilage between the condyle and tibia. The joint is locked, and it may be a matter of a few hours until the cartilage jumps back with a

characteristic "snick." Again this condition requires to have expert treatment, and frequently the expert is represented by the patient himself, who, after years of recurrent dislocations, has devised a simple way of his own of getting the limb back to normal. There is always a slight synovitis for a few days afterwards. Recurrence may necessitate the operation of meniscectomy, when the offending cartilage is removed.

Special Plaster Casts

Colles's Fracture.—Materials required: 28 inches of 3-inch stockinette, 6 3-inch plaster of paris bandages.

Method.—The plaster cast should extend from the metacarpophalangeal joints to the elbow, the thumb being left free. The wrist is immobilized in a position midway between flexion and extension and in ulnar deviation, the arm being fixed in full pronation.

The stockinette is fitted with a hole for the thumb; 8 layer slabs are then measured and moulded over the flexor and extensor surfaces of the arm and then bound together with two rolls of plaster bandage. The cast is then moulded to the palm and dorsum of the hand. Full use of the fingers and arm must be insisted upon immediately.

Sugar Tongs Splint.—This type of plaster splint may be adopted in immobilization of the forearm or wrist and is an adequate means of support in the treatment of injuries at either of these sites. Materials required: gauze bandages 3 inches or 4 inches wide; plaster bandages 3 inches or 4 inches wide.

Method.—Careful measurement having been taken from the knuckles to just above the elbow by passing an ordinary gauze bandage from the knuckles, along the posterior surface of the forearm, around the elbow and over the anterior surface of the hand, the freshly-soaked plaster of paris bandage is then measured off to the required length and applied immediately, creasing over the olecranon area being carefully avoided. The splint is then bandaged in order to mould it to the limb. If used in the treatment of a newly fractured limb, the gauze bandage must be applied sufficiently loosely to allow for any swelling which may occur. Trimming to the exact measurement should be performed before the plaster hardens, so that free movement of the thumb and fingers is not impeded.

Plaster of Paris Spica of Shoulder.—The cast is used in the treatment of osteomyelitis, injuries of the humerus and shoulder joint and tuberculosis of the shoulder, in order to produce complete immobilization. Materials required: Cellona

24-inch wide or ready prepared plaster fabric; the required number of roller plaster bandages.

Method.—The "Cellona" or plaster fabric is cut to form two patterns as shown in the diagram (Fig. 17) which should be made according to the patient's measurements.

The patterns should reach from both iliac crests to the shoulder, and should be applied to the anterior and posterior aspects, extending on one side over the injured shoulder. They are then strengthened with a roller plaster bandage which encircles the whole area of fabric.

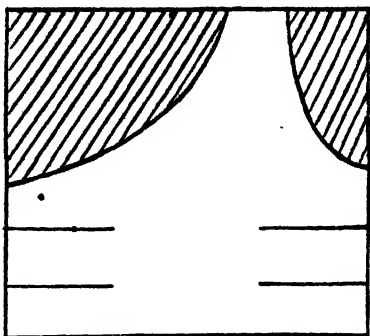


FIG. 17.—PATTERN FOR SPICA OF SHOULDER.

The arm is now enclosed in a cast, made by using slabs and roller plaster bandages, which is finally united with the main cast by means of a figure-of-eight plaster bandage; reinforcements are also applied to the under surface of the cast in the axilla.

Hip Spica.—The hip spica can be adapted for use either unilaterally or bilaterally according to the extent of immobilization required.

Materials Required for the Unilateral Hip Spica.—20 to 25 rolls of 6-inch plaster bandage; 20-inch length of 9-inch stockinette; 16-inch length of 6-inch stockinette; 18-inch length of 3-inch stockinette; 6 pieces of felt (one 6 by 12 inches, one 3 by 36 inches, two 3 by 10 inches, two 4 by 10 inches). These quantities are as used for an adult.

Procedure.—The cast should extend from the nipple line to the toes. The stockinette is fitted and the felt padding applied before putting the patient in position. The widest stockinette is used for the trunk, the medium-sized for the thigh and the 3-inch for the leg. The largest piece of felt should be attached to the stockinette over the sacrum and spinous processes; the long strip should be secured around the thorax about 1 inch below the nipples. The 4-inch by 8-inch pieces should protect the iliac crest, and the 10-inch strip the malleoli and the inner surface of the groin in the region of the ischial tuberosity.

A leg cast is now applied, and the trunk enclosed in a plaster cast made by encircling bandages, unless a previously cut plaster fabric be used; either should be strengthened with strips of plaster-of-paris bandage applied transversely. Both sections of

the cast are then united with a figure-of-eight plaster bandage, enclosing reinforcing strips as described in the diagram (Fig. 18).

The double or bilateral hip splint varies only in that all reinforcements are duplicated and the extremities are united by a narrow strip of wood, which is attached to the anterior surface

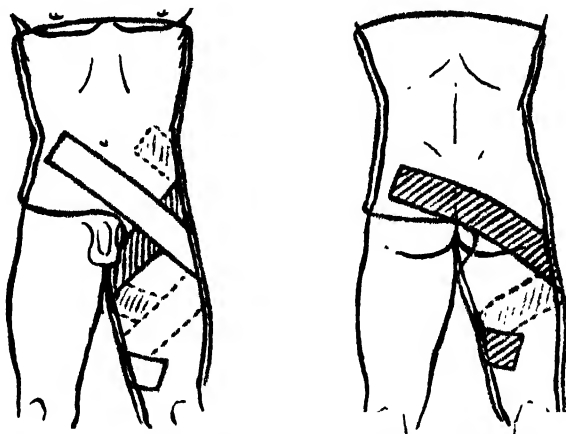


FIG. 18.—HIP SPICA, SHOWING APPLICATION OF REINFORCEMENT SLABS, 2 TO THE ANTERIOR SECTION, 1 TO THE POSTERIOR.

of the thighs after the plaster is set, by means of a figure-of-eight plaster-of-paris bandage. The single hip plaster immobilizes only the hip, femur and knee, whereas the bilateral hip plaster gives additional immobilization to the whole pelvis.

Congenital Dislocation of Hip.—The method of application of a plaster cast in the treatment of congenital dislocation of the hip is of the utmost importance; the cast is applied after reduction of the hip by the Lorenz method. The legs are in full abduction and external rotation and flexed to 90°, the cast enclosing the pelvis and both legs as far as the knees. It is imperative that the plaster should be kept dry, in order to prevent cracking (which may be the cause of redislocation); this may be avoided if an application of shellac varnish be used on the cast after it has been trimmed and allowed to set; furthermore the child should be nursed on a frame with the legs supported, in order to prevent severe rotation strain at the hips.

Immobilization of Cervical Spine.—The following are required: 12 to 15 6-inch roller plaster bandages; 20 to 26 inches of 9-inch stockinette; 14 inches of 6-inch stockinette; felt suffi-

cient for pattern as shown in diagram (Fig. 19). These quantities vary according to the size of the patient—the above being for an adult male.

Procedure.—The hair covering the occiput and that in the area of the neck should be shaved. The patient is then dressed in the 9-inch tubular stockinette; this is arranged to form a long vest, and the shoulder seams are closed in, after which the 6-inch tubular stockinette is slipped over the head and sewn to the neck line of the vest, a hole being cut out for the nose. The felt padding is now sewn on to the stockinette according to the usual practice in such procedures.

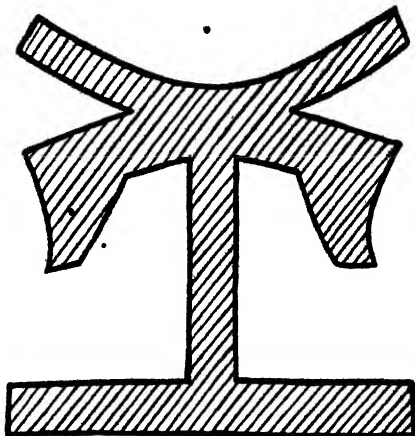


FIG. 19.—IMMOBILIZATION OF CERVICAL SPINE. DIAGRAM SHOWING PATTERN OF FELT PADDING.

Slabs in plaster-of-paris bandage are now prepared as follows. A 6-inch bandage in 6 layers for the head band is finally cut down to the measurement of the felt head band. Two slabs of 8-inch bandage in 6 layers are prepared for the remainder of the cast. After the head band is applied, it is retained in position by a few circular turns of a roller plaster bandage. The next slab to be applied should reach from the back of the head band to the end of the spinal strip of felt, and should be cut to fit the felt. Another slab is now applied round the neck fitting up against the mandible in the front, and one to the back and to the sides; in the last it should reach the mastoid process. These are now retained in position by circular turns of a roller plaster bandage, the spica figure being used for the neck and shoulders. Further slabs are applied to the trunk and incorporated with the head and neck plaster with circular turns of a roller plaster bandage. The stockinette is now trimmed and the edges turned over and retained in position with a further circular turn of a roller bandage.

The cervical plaster bandage is used in the treatment of fracture and dislocation of the cervical spine and in tuberculosis of the cervical spine.

Immobilization of Lumbar and Dorsal Vertebrae.—Materials required: 25 rolls of 6-inch plaster bandages or a length of pre-cut plaster fabric; 36 inches of 9-inch stockinette;

5 pieces of felt: 1, 4 by 18 inches, 2, 4 by 6 inches, 2, 4 by 8 inches.

Procedure.—Before the plaster is applied, the stockinette is made into a vest by passing it over the trunk and sewing it over each shoulder and between the legs; the felt padding is then sewn on to the vest over the spinous processes from the sacrococcygeal joint to the 5th dorsal vertebra, also over the area of the upper end of the sternum and symphysis pubis and the iliac crests. If pre-cut plaster fabric be used, 5 thicknesses will be cut according to the diagram and will be applied to the anterior or posterior surfaces of the trunk as required; these are then bound together with an encircling roller plaster bandage.

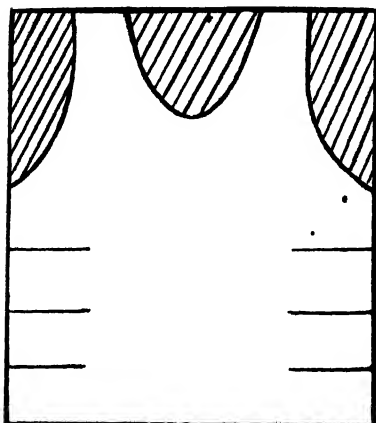


FIG. 20.—PLASTER JACKET CUT IN PLASTER FABRIC; THE PATTERN SHOWING SPACES LEFT FOR NECK AND ARMS.

age; finally the cast is reinforced with plaster slabs, according to the diagram (Fig. 21). If the roller plaster bandages are used, slabs of 8 thicknesses are applied as follows:

1. From the suprasternal notch to within an inch of the symphysis pubis;
2. From the sacrococcygeal joint to the 5th dorsal vertebra;
3. From the suprasternal notch round to the sacrococcygeal joint;
4. From the suprasternal notch round to the 5th dorsal vertebra.

The first two slabs are placed in position with as little delay as possible after they are made and are then encircled by a roller plaster bandage; 2 each of the last slabs are then placed in position and retained in position with a further roller plaster bandage. The shoulders are not included within the plaster bandage. The plaster is thoroughly rubbed, plaster cream being used in order to produce a smooth surface. When the plaster is set the patient in both cases is placed in a

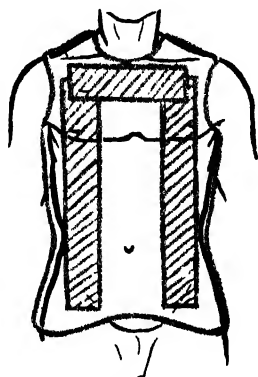


FIG. 21.—PLASTER JACKET SHOWING REINFORCEMENT SLABS.

supine position on a firm bed, with sufficient support to produce hyperextension of the back.

Tobruk Plaster.—This plaster splint, a product of World War II, is by far the most adequate form of immobilization and traction used in the treatment of simple and compound fractures of the femur especially when it is necessary to transport the patient any great distance from one hospital to another.

Materials required: adhesive strapping; 10 to 12 3-inch plaster-of-paris bandages; Thomas's hip splint.

Adhesive extension strips are measured and should extend from above the site of fracture for a few inches to the required distance below the foot. When they have been applied to the limb, a plaster cast is made which should extend from the groin to the toes, leaving windows over the areas of the malleoli in order to permit traction of the adhesive strips.

The knee should be in a position of 10° flexion and the ankle fixed at a right angle. The Thomas's splint is then secured on the limb with one or two roller plaster bandages. The areas beneath the ring of the splint and the plaster cast in the groin are carefully padded in order to prevent friction; the stirrup ends of the adhesive strips are then attached to the lower end of the Thomas's splint, being twisted in order to produce the required amount of traction. The plaster cast may be cut on both sides when it is necessary to do so, this allowing swelling and thus preventing the occurrence of circulatory complications.

CHAPTER 5

SUPPURATIVE DISEASES

THE PYOGENIC BACTERIA. TOXAEMIA. LOCAL SUPPURATION. CARBUNCLE. ABSCESS. CELLULITIS. LYMPHANGITIS. SEPTICAEMIA. PYAEMIA.

SEPSIS is due to the entry of pyogenic organisms into the body, and their multiplication there, the result being destruction of the body tissues. The severity of the infection depends upon 2 factors: 1. the resistance of the body tissues; 2. the virulence of the attacking germs. Thus elderly or debilitated patients offer poor resistance and bacteria are more likely to gain the upper hand when the health of the tissues locally has been lowered by injury, operation or the presence of some non-pyogenic organism such as the tubercle bacillus or the fungus of actinomycosis.

The Pyogenic Bacteria.—The staphylococci (*Staph. aureus*, *albus* or *citreus*) are usually present on healthy skin. They are responsible for nearly all pimples, boils, small abscesses or other skin eruptions of a septic nature. They rarely invade the blood stream but may be the cause of osteomyelitis. Streptococci may cause local lesions, such as impetigo or erysipelas, but usually spread rapidly, causing cellulitis or septicaemia with grave toxæmia. The coliform bacilli are useful inhabitants of the large intestine, but may invade surrounding tissues, producing foul-smelling pus, or the urinary tract, with a resultant pyelitis. These organisms, with the gonococci and the pneumococci, are at the root of most of the septic conditions of surgery.

Bacteria enter the body through a break in the skin or mucous membrane, producing a local reaction at their point of entry, and a greater or lesser amount of toxæmia. Treatment must be considered from two points: the general or constitutional reaction due to absorption of toxins, and the local reaction with its inflammation.

Toxaemia.—The circulation of poisons generated in some focus of pyogenic organisms causes a rise of temperature, increased rapidity of pulse, headache, sleeplessness, vomiting and sometimes delirium. The tongue becomes dry, the excretions are scanty and albumin may appear in the urine. These symptoms vary with the severity of the infection.

In severe cases rigors and delirium are frequent, while the temperature may remain at 103° F. or 104° F. until the cause of the toxæmia is removed or combated. Should abscess formation occur a remittent fever develops, and if the pus is not speedily evacuated damage occurs in the vital organs. Before the advent of penicillin waxy disease of the kidneys often developed as a result of prolonged toxic absorption.

Sapraemia is a special form of toxæmia that is due to absorption of toxins from separated dead tissue (e.g. the retained placenta).

Treatment.—The patient should in all cases be put to bed. Rest is most important; pain when present must be controlled by drugs, and adequate sleep induced. Fluid intake should be increased to 6 pints daily; fruit juice and glucose are valuable. When vomiting is severe fluid should be introduced by rectum or intravenously in the form of normal saline or 5 per cent dextrose. Careful record should be kept of fluid intake and fluid loss. The diet should consist chiefly of milk while the temperature is high. Vitamin C (ascorbic acid) is given in large doses and anaemia is combated by iron tonics, liver extract (e.g. Cytamen) and where necessary by blood transfusion. Protective foods are necessary in convalescence. A daily bed bath is valuable; it stimulates excretion of toxins by the skin and helps to reduce pyrexia. Hyperpyrexia is treated by tepid sponging. Constipation is controlled by gentle laxatives or by enemas.

The surgeon now has powerful allies, the antibiotics obtained from moulds, and the sulphonamide group of drugs. These prevent the multiplication of most pyogenic organisms without doing much damage to the body tissues. To a great extent they have replaced the antitoxic sera, which formerly were the surgeon's only reserve. Of the antibiotics, penicillin is the first and most generally used, it is destroyed by heat, acid and metals, and does not exert much effect when large collections of pus are present. *Bact. coli* actually destroy it, and it has little effect on gram-negative organisms. This is where streptomycin is useful; originally used against the tubercle bacillus it is now often prescribed with penicillin to combat secondary invaders. Aureomycin and chloromycetin are also valuable; they have the advantage of being effective when administered by mouth.

The sulphonamide drugs work in the same way. The earlier drugs, sulphanilamide, sulphapyridine and sulphathiazole, are toxic to some individuals; sulphamethazine and sulphadiazine are safer. All may be given by mouth, although intramuscular preparations are also available. A large initial dose—2 to 4 grammes—is given and 4-hourly doses of 1 gramme are continued for some days. Six pints of fluid should be taken daily, and the urine kept strongly alkaline by potassium citrate or

sodium bicarbonate, to guard against kidney failure. One or both of these drugs may be prescribed to keep the organisms in check while local treatment is given. The local treatment depends on the cause, and is discussed below, but in all cases in which a limb is affected the part should be elevated and supported by sling or splint while the treatment is being given.

Local Suppuration.—Acute suppuration locally may cause a boil, carbuncle or abscess. The boil (or furuncle) is the result of infection of a hair follicle usually by staphylococci. A small, red, hard painful swelling develops, surrounded by a ring of fibrous tissue. The centre liquefies and finally the surface breaks down, with a discharge of pus and the formation of a small central slough. When all dead tissue has been discharged the cavity heals by granulation. Boils tend to occur in crops. They may be associated with faulty diet or diabetes or with general ill-health.

Treatment.—The application of poultices and fomentations, by lowering the resistance of the surrounding skin, often leads to the formation of other abscesses. Magnesium sulphate in 12 per cent solution may be used in a compress or the painful area may be painted with glycerine and ichthyol. Hot bathing at 2-hourly intervals is soothing and effective. Some surgeons prefer to incise the boil, whereas others use Bier's suction cups—a very painful proceeding for the patient. Once the boil discharges, antiseptic dressings of flavine or penicillin cream are satisfactory. In cases in which recurrent crops of boils occur, the urine should be tested for sugar and an autogenous vaccine prepared from the pus.

Carbuncle.—A massive invasion of the subcutaneous tissues may result in the development of a large, hot area, which later discharges pus and sloughs through many small craters. Carbuncles occur in debilitated patients, usually on the neck or back. They produce great general disturbance, pyrexia and malaise.

The general treatment is in accordance with the cause. Diabetes or albuminuria may be present. Local exposure to x-rays is most effective. If this treatment should not be available, magnesium sulphate compresses may be used, or the area excised and later treated by skin grafting.

Abscess.—This may arise owing to the imprisonment of bacteria in the deeper tissues, the breakdown of a lymphatic gland or the blockage of the duct in an infected compound gland. The pus is held up by a hard fibrous capsule and as it collects, a hard, red, hot, painful swelling results. The increasing tension thins the surface tissue and a point of fluctuation develops. In untreated lesions, the skin over this area breaks down, the contents of the cavity discharge and repair is gradually effected by granulation tissue.

Treatment.—In the early stages, heat, provided by electric pad or poultice, is helpful. Incision and drainage should be instituted as soon as the abscess points. When the cavity is a large one it may be irrigated with "Milton" (10 per cent solution); otherwise penicillin solution may be introduced through the tube at 3-hourly intervals. Healing is usually rapid. The tube is removed when the discharge becomes serous. In some cases healing is incomplete and a narrow channel, lined by granulation tissue, may be left leading to the surface. This is called a sinus. It may be due to the retention of a slough, sequestrum or foreign body, and requires to be dealt with by operative treatment. A similar channel, connecting a hollow organ to the surface, or one hollow organ to another, is called a fistula.

Cellulitis.—Streptococci rarely remain localized. They spread rapidly along the tissue planes, forming a large, brawny swelling, with much toxæmia. If possible the inflamed area should be elevated by raising the limb. Radiant heat should be applied frequently, and general measures be taken to cope with toxæmia.

Lymphangitis.—In severe streptococcal infection, a red line may be seen running up the limb from the wound. This is due to infection of the lymphatics. The lymph glands receiving the infected lymph become enlarged, hot and red; they may break down and suppurate in their efforts to prevent the invaders from reaching the blood stream. Inflammation of the glands is known as adenitis.

Septicæmia.—In this condition the organisms pass into the blood stream and continue to proliferate there, thus making a culture medium of the blood.

Treatment.—The limb should be raised; treatment should be given to the causative wound and active general measures should be taken. Septicæmia is usually streptococcal in origin, and there is much general toxæmia. The temperature is high (102° F. or 103° F.), the pulse is rapid and feeble, the tongue dry and delirium may be profound. It is a very serious condition. Local treatment is of little use, although the original wound should be drained.

A specimen of blood should be cultured, and active general measures relied on. A course of penicillin or of sulphonamides is started. Intravenous saline or dextrose is given continuously at the rate of 40 drops a minute, to combat dehydration. Symptoms are treated as they arise; sedatives may be necessary to control delirium; heart stimulants may be called for.

Pyæmia.—Small collections of infected material circulate in the blood stream; streptococci or staphylococci may be the causative organisms. The condition is marked by rigors, intermittent fever and the formation of multiple abscesses. These are

caused by the infected particles—septic emboli—being caught up in the smaller vessels. They may develop in any part—skin, brain, lung, kidney, joints or intestines. The treatment is the same as that for septicaemia ; the abscesses are dealt with as they occur.

CHAPTER 6

COMMON SURGICAL AFFECTIONS

ULCERS OF THE STOMACH AND DUODENUM. PYLORIC STENOSIS. APPENDICITIS. ACUTE PERITONITIS. SUBPHRENIC ABSCESS. HERNIA. STRANGULATED HERNIA. INTESTINAL OBSTRUCTION. INTUSSUSCEPTION. HAEMORRHOIDS. DISEASES OF THE GALLBLADDER. CHOLECYSTITIS. CHOLELITHIASIS. INJURY TO THE LIVER. DISEASES OF THE URINARY ORGANS. PYELITIS. CALCULUS. RENAL CALCULUS. CYSTOSCOPY. TREATMENT OF RENAL AND VESICAL CALCULUS. INJURIES TO THE KIDNEYS. INJURIES OF THE BLADDER. RUPTURE OF THE URETHRA. ENLARGEMENT OF THE PROSTATE GLAND. GENITO-URINARY DISEASES. STRICTURE. PHIMOSIS. PARAPHIMOSIS. BALANITIS. CIRCUMCISION. ABNORMAL POSITION OF THE TESTIS. HAEMATOCELE. HYDROCELE. VARICOCELE. ORCHITIS. EPIDIDYMITIS. DIVERTICULITIS. RECTAL PROLAPSE. ISCHIORECTAL ABSCESS. FISTULA-IN-ANO. ADENITIS. AFFECTIONS OF THE VEINS. WHITLOW. SEPTIC ARTHRITIS. BURSITIS. EXCISION OF THE SEMILUNAR CARTILAGE. ACUTE OSTEOMYELITIS. DEFECTS AND DEFORMITIES. CONGENITAL DISLOCATION OF THE HIP. CLUB FOOT. TORTICOLLIS. HALLUX VALGUS. HALLUX RIGIDUS. HAMMER TOE. FLAT FOOT. SPINA BIFIDA. SCOLIOSIS. OPERATIONS. AMPUTATION. ARTHROPLASTY AND ARTHRODESIS. LAMINECTOMY. TENOTOMY. CRANIECTOMY.

IN many of the surgical affections, the nurse may see very little of the patient before his operation. Most of her work is done after the operation, since as a rule the patient spends very little time in the ward previous to it. The majority of surgical cases are admitted for prearranged operation from the out-patient department or from the patient's home, and many of them are emergencies. The real work of the surgical nurse comes after the operation, and in the following pages a brief review of this is made, with emphasis on the treatment of the commoner surgical diseases.

It should be noted, however, that when the patient is admitted

to hospital some time before the operation is due to take place, nurses should give attention to the condition of the teeth and the state of the mouth generally, so that any septic or other unhealthy focus may be adequately treated beforehand. By the observance of this practice, the incidence of post-operative chest conditions has been greatly diminished in many large hospitals. Breathing exercises carried out before and after operation are also of very great value.

Ulcers of the Stomach and Duodenum

At one time gastric ulcer and duodenal ulcer were dealt with separately; now they are best regarded as similar conditions, occurring on one or the other side of the pyloric sphincter. The actual cause is irritation by the acid juice of the stomach.

Characters.—There are 4 common sites of ulceration of the mucous lining of this part of the alimentary canal viz. the cardiac orifice, the body of the stomach, the duodenum and the jejunum. The first and last are unusual and as a rule the second and third conditions are of main importance. The majority of ulcerative conditions are found close to the pyloric canal. The condition may arise more or less acutely, although there are usually premonitory symptoms.

Causes and Signs.—In going into the history of a case of peptic ulcer, we usually find that the patient has suffered for a long time from "indigestion pains" which come on a certain time after a meal. Taking food or some alkaline powder, such as magnesia or baking soda (sodium bicarbonate), brings almost instant relief. A patient may have 3 months of regular pains of the above type, then 3 months of complete freedom. One of the typical signs is that the pain wakens the patient out of his sleep. Contributory causes are a highly-strung nervous system, overwork with hurried meals at irregular intervals, carious teeth or the reflex irritation from inflamed appendix or gallbladder.

The symptoms vary according to the individual, but in the gastric cases the pain comes on about 2 hours after a meal, whereas in the duodenal cases the occurrence of pain may coincide with the half-hour before the next meal. hence the term, hunger pain. When the ulcer becomes massive and deep it may give rise to vomiting, haematemesis or melaena.

Diagnosis.—The diagnosis of peptic ulcer is made: 1. by x-ray after a barium meal, this showing the irregularity in outline due to the excavating ulcer; 2. by giving test meals and finding out by gastric analysis whether the stomach contents are abnormal, 3. by examining the faeces for obvious blood or "occult" blood. In the last case it is advisable to examine the

faeces after the patient has been restricted for at least 48 hours to a diet of milk food, starch and eggs.

Complications.—As a general rule medical treatment of peptic ulcer is successful. In the event of the ulcer getting out of control, the complications of perforation, malignant changes, severe haemorrhage, peritonitis and gastric dilatation with pyloric obstruction, are all conditions requiring surgical aid. A perforation shows the usual evidence of acute shock, with great pain, rigidity of the abdominal wall, subnormal temperature to begin with but rising later, vomiting of blood and mucus and rapid pulse. A dilated stomach shows signs in time of retention of the food, with severe and offensive vomiting.

Treatment.—We can divide the treatment of peptic ulceration into medical and surgical branches.

The medical treatment is based on rest for the affected area, plus reduction of the highly irritative acid. It must be remembered that the stomach is rarely without some food in it and it may be active for 18 hours out of 24. Dietetic restriction has already been fully discussed, Vol. III, and a careful combination of appropriate food with alkaline powder will give the minimum work to the stomach muscle, with the maximum neutralization of the stomach juice. Confinement to bed may be necessary for 1 to 2 months, but it should be impressed on the patient that attention to the routine as described will ultimately bring relief. Of useful drugs, atropine, alkalis and olive oil are outstanding. The alkalis may consist of preparations of aluminium hydroxide and magnesium trisilicate. A scheme of treatment, giving details hour by hour, is usually drawn up for each patient, and the scheme can be varied according to the stage of progress. It is assumed that before any treatment is instituted such conditions as septic teeth, chronic appendicitis and other disturbing factors have been investigated. Medical treatment may have to go on for years, but it is not very irksome and it has distinctly beneficial effect. The alternative to it is surgical treatment, which is usually the patching up of a gross lesion resulting from neglect of doctor's orders. Alcohol and tobacco should be very much restricted.

The surgical treatment has various aspects. It is now established that such treatment should be considered only when the patient is undoubtedly non-responsive to medical remedies or when there have been permanent effects such as cicatrization of a pyloric ulcer causing stenosis, "hour-glass contraction," repeated small haemorrhages, or perforation. As well as in emergencies, when surgical intervention may be a means of saving a life, surgical treatment of peptic ulcer is often indicated, and is usually successful, when operations are done to relieve the

effects of pyloric obstruction, or to put a stop to constant leaking of blood which may have persisted even after a course of feeding directly into the duodenum by rubber tube passed down from the mouth.

A serious haemorrhage should be dealt with by rest, morphine, blood transfusion and ice internally and externally, rectal feeding being instituted.

While we may be content with medical treatment for an ordinary peptic ulcer, it is surgical treatment that is necessary for the above-mentioned complications, each of which is described below.

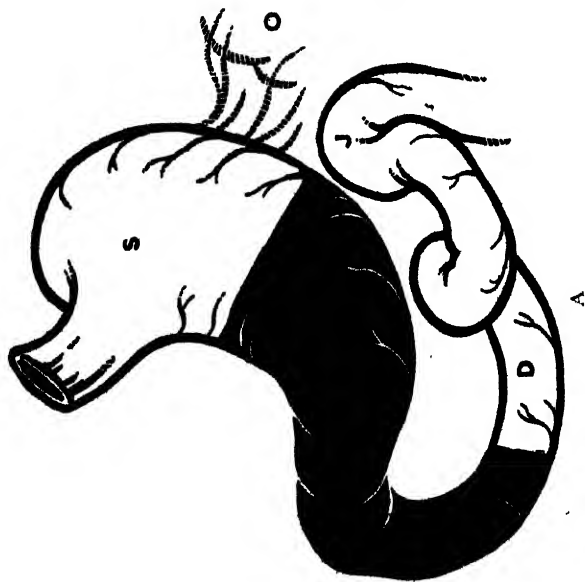
Excessive Haemorrhage.—In such cases, if there is danger to a large artery, the abdomen should be opened after the usual preparatory phase of light diet, alkaline wash-outs for the stomach, cleansing of the lower bowel and dental hygiene has been instituted. When the ulcer is exposed, the bleeding point is secured and the operation of partial gastrectomy and gastroenterostomy performed, so that the ulcer and the acid-forming portion of the stomach are removed.

The aim of the operation of partial gastrectomy and gastroenterostomy is shown in Fig. 22, A and B. Fig. 22, A shows the area of the stomach and duodenum that is excised, and Fig. 22, B the end result of the operation.

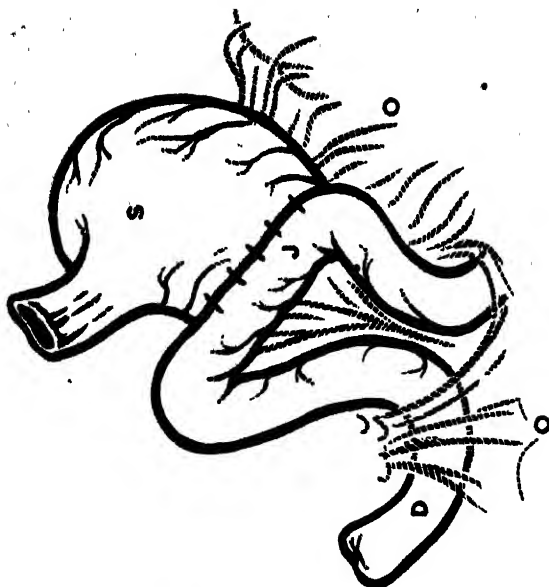
Perforation.—When the signs (already described) appear, the surgeon must perform an operation at once, all food by the mouth having been stopped. The danger is the excursion of stomach contents into the peritoneal cavity, a serious form of general septic peritonitis being set up in a few hours. After rapidly suturing the ulcer, the surgeon makes an attempt to cleanse the peritoneum, which is usually oedematous; a drainage tube is left in position as low down as possible i.e. just above the pubic margin.

Gastroenterostomy may also be performed for adhesions, pyloric obstruction and "hour-glass contraction" of the stomach. The after-treatment is the same for all these operations, the patient being kept in Fowler's position until there is no further danger of toxic supremacy. The nursing of all these cases is very exacting. First there is the constant watch to limit the spread of peritonitis; secondly there is the matter of diet.

Since the after-treatment of gastroenterostomy, with or without peritoneal drainage, is typical of many other methods applicable to abdominal disease, we may study it extensively at this point. The immediate effect is usually shock, which results from the handling of the bowel, from the influences of unusual external factors on a very sensitive area and may be from toxæmia as a result of septic invasion. Or the possibility of a reactionary haemorrhage must always be in the mind of the nurse when she



A



B

FIG. 22.—PARTIAL GASTRECTOMY AND GASTROENTEROSTOMY.

A shows area excised (in black).

B shows the completed operation.

d, Duodenum.

j, Jejunum.

o, Omentum.

s, Stomach.

sees her patient suddenly collapse after an abdominal operation.

To begin with, shock may demand that the patient be put to bed with the head low and the knees supported by a bolster. The application of heat, the giving of salines and the usual methods of fighting the condition must be applied as described elsewhere. Once shock is overcome the patient should be propped up in Fowler's position, and regular dressings should be done. The nurse should be on the look-out for the following conditions.

1. *Bleeding*.—Internal haemorrhage, with sudden pain, abdominal distension, dizziness, pallor and collapse, with imperceptible pulse, should be first in the mind.

2. *The Pulse*.—After all abdominal operations, the pulse is above normal, but quickly settles down on the 2nd day. In the case of internal bleeding, the pulse will become very rapid, and ultimately will be uncountable. When peritonitis is spreading, the pulse rate will gradually increase and become smaller. An hourly chart should be kept; there may be slight variation owing to inevitable flatulence. When the temperature and respiration remain steady, there is nothing to be alarmed about.

3. *Temperature*.—When there is a sudden rise of temperature, an irregular course, a rigor, or any unusual drop the matter should be immediately reported.

4. *Pain*.—There is always pain in the first 24 hours, chiefly due to flatulence or painful peristalsis.

5. *Vomiting*.—In all laparotomies (i.e. opening of the abdomen) there is some postoperative sickness; there is always a grave danger that the operation wound may be disorganized by constant retching, which may become reflex and uncontrollable. The nurse should be ready to apply gentle pressure with the flat of her hand over the site of the wound if the condition should become marked. Sedatives should be given if ordered. Aspiration of the stomach contents may also relieve this condition; this is described in more detail later.

6. *Bladder*.—Nearly every patient is worried about the bladder after an abdominal operation; the desire to pass urine is present, but the accomplishment is impossible owing to interference with the reflex and to vesical paralysis. In time urine is passed with difficulty, but the power is soon regained to the full. Catheterization should always be the last resort.

7. *Bowels*.—The first evidence of recovery of bowel tonus is the passage of flatus; nurses should always report this, noting the time. A flatus enema may be ordered.

8. *Distension*.—Abdominal distension after an operation is always a bad sign. The most dangerous type is paralytic ileus, which is the result of muscular paresis of the walls of the bowel. The latter is thus ballooned out with flatus; vomiting and con-



FIG. 23.—MOYNIHAN'S STOMACH
FORCEPS.

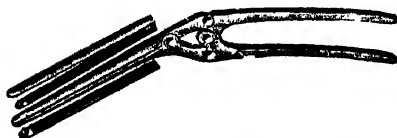


FIG. 24.—PAYR'S STOMACH CLAMP.



FIG. 25.—MORRIS'S RETRACTOR.

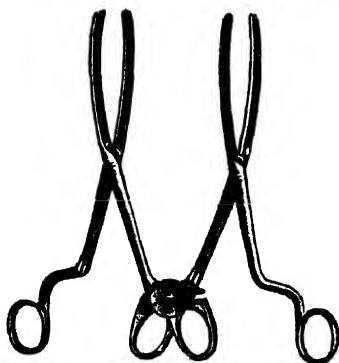


FIG. 26.—CARWARDINE'S INTES-
TINE FORCEPS.



FIG. 27.—CULLINGWORTH'S
FULL-CURVE NEEDLE.

(By courtesy of the Surgical Manufacturing Co, Ltd., London.)

stipation become serious and very often the patient dies of toxæmia.

The routine treatment for cases of gastroenterostomy is first the giving of continuous rectal or intravenous salines for the first 48 hours or more as necessary. A Ryle's tube is passed into the stomach via the nose before operation and left *in situ* until the surgeon is satisfied that there is no regurgitation into the stomach, due either to a kink, which may cause a "short circuit," or to intestinal obstruction.

In order that the surgeon may assess these facts, the nursing staff must keep accurate records of fluid given to the patient by mouth, and fluid aspirated from the stomach. In most hospitals nowadays, the Ryle's tube is attached to an electrical suction apparatus.

On the third day a purgative enema may be given, after which laxatives by the mouth should be effective.

As a rule, however, the condition gradually clears up, and in cases of septic peritonitis the discharge diminishes and the tube may be removed. The only complication to be apprehensive of in slow cases is hypostatic pneumonia which results from basal congestion of the lungs and is described elsewhere in this work. If the patient be kept well supported in the upright position this contingency need not be feared.

Lastly, there is the question of diet. The consensus of opinion is that in all laparotomies, particularly when the bowel has been opened or repaired, liquids should be given for a week, although nowadays some surgeons allow a very light diet after the 3rd day. For the first 48 hours, it is sufficient to give teaspoonfuls of sterile water by the mouth at $\frac{1}{4}$ -hourly intervals, assuming that the continuous saline is in operation. As time goes on, the oral fluid may be increased, and by the 3rd day the patient may be allowed albumen water or any of the easily digested fluids described in Vol. II, especially one of the patent foods, milk and soda water, chicken broth or a cup of weak China tea; up to the end of the first week, these are gradually increased until a light diet is instituted, which progresses by easy stages to a modified ordinary diet in the 3rd week. As we have noted above, allowances must be made for individuals in every case. The nursing of postoperative cases of laparotomy is an art which involves a full understanding of the way in which the altered conditions are influencing the whole being of the patient.

Pyloric Stenosis

Pyloric stenosis in the adult is due often to ulceration or to cancer, but there is one condition, found in infants, and known as congenital pyloric stenosis, or congenital hypertrophy of the

pylorus, in which for some unexplained reason, the pyloric outlet remains in a kind of spasm, so that there is obstruction to the passage of food. (See also Section XIII.)

Symptoms.—Although these cases are rare, they are so very interesting that once seen they are never forgotten. Generally the patient is a first baby and of the male sex. He does fairly well for about a fortnight or 3 weeks, then it may be noted that he has constipation of obstinate type, with green stools. When the case is fully developed, the abdomen becomes distended and it is noticeable that a wave of peristalsis passes along the thin chest wall, showing the powerful movement that must be going on in the stomach below. The child may be eager for his feeds, but as soon as the stomach is full he suddenly has an attack of projectile vomiting, the whole of the feed being shot out over the mother or nurse or even the observing doctor. When the child begins to go downhill, great alarm is caused and operation is indicated.

Treatment.—The classical operation is that of Rammstedt. A very small incision is made over the site of the pylorus; the latter is exposed and the muscular wall is found to be hypertrophied. As the surgeon divides the fibres, leaving the inner coat intact, the knife appears to be cutting cartilage, so hard is the tissue. Ultimately the pylorus in its new state functions as well as any other.

There has been a development within recent years of the purely medical side of the treatment, although surgery may finally have to be resorted to. Eumydrin, an atropine preparation, is given half an hour before each feed is due, the treatment lasting for 4 to 8 weeks, according to progress made. The dose is 1 to 6 mls. of a 1 in 1,000 mixture of the drug. The cardinal signs of progress are cessation of vomiting and steady increase in weight. (See also Section XIII.)

From the nursing point of view, the pre-operative treatment is important, as the stomach must be washed out several times, and especially until 2 hours before the operation. Salines and other remedies against shock are of especial importance. Gradual increase of the feeds is the rule for 4 days after operation, beginning with 1 drachm of mother's milk 4 hours after operation. The routine is then established of giving 3-hourly feeds of 1 drachm each, until 4 feeds have been given, then slowly building up. Artificial feeding by skimmed milk for the first 3 days is followed by gradual increase of cream. There are many different methods of reorganization of feeding, most very successful. The outlook for such children is good.

Appendicitis

Inflammation as a result of microbic activity commonly takes place in the walls of the appendix, and since there is a poor blood supply, the *B. coli* (generally the causal factor) soon gains the upper hand. The inflammation spreads to the surrounding peritoneum, causing peritonitis. The appendix is peculiarly apt to be affected in persons from 10 to 20 years of age and it is one of the commonest surgical emergencies of the adolescent.

Causes.—These may be summarized as follows.

1. In the *cul-de-sac* of this narrow worm-like offshoot of the caecum, hard masses of faeces may develop. It is doubtful whether any hard particles of food, such as pips, pieces of nuts or fig seeds, can be blamed. Most probably the hard faeces cause erosion, and the waiting organisms seize, as usual, the chance of a breeding ground. Appendicitis should be regarded in the main as a disease in which constitutional disturbances are summated at one point. The whole battle, so to speak, for integrity against bacterial toxins is brought to its climax at the appendix.

2. Inflammation and congestion, with oedema, occur; the tip of the appendix is cut off from its blood supply and may rapidly become gangrenous. The lymphoid tissue aids the process.

3. The occurrence of obstinate constipation, or the measures (e.g. purgation) taken to relieve it, may produce a generalized inflammation of the mucous membrane of the bowel. The appendix, participating in the involvement, is rendered open to attack by microbes.

Pathology.—When the microbes invade the mucous membrane they cause it to swell and thus catarrhal appendicitis is the result. Usually the organisms continue on their way until they reach the serous covering, and there the peritoneum, ever protective, tries to screen them off. Thus adhesions are formed. The second possibility is the formation of a local abscess, the space limited by adhesions. The most serious condition is that of general septic peritonitis. Often the abscess or peritonitis is centred on a gangrenous tip.

Varieties.—Based on the above, we recognize 4 varieties of clinical appendicitis, viz. catarrhal appendicitis; appendicitis with abscess, the tip being gangrenous or perforated in some cases; appendicitis with general peritonitis; recurrent or chronic appendicitis.

Symptoms and Signs.—In catarrhal appendicitis there is always some local peritonitis. The onset is usually sudden with generalized abdominal pain at first, followed by severe pain in the right iliac fossa, the point of maximum tenderness being known

as McBurney's point, situated at the junction of the lateral and middle thirds of a line drawn between the umbilicus and the anterior superior spine of the ilium. Some fever and vomiting occur, and there is usually constipation of an obstinate type. Generally the muscles are rigid over the affected area and there may be pain on micturition. This type of appendicitis usually passes off in 3 to 4 days, but adhesions are left. In the case of the abscess or gangrenous tip, the symptoms are much more severe, the temperature rising quickly and the pulse becoming steadily more rapid. The patient lies in bed with the knees drawn up. Generally speaking, the greater the extent of the peritonitis, the more severe the signs and symptoms.

Treatment.—It must be admitted that the offhand method of prescribing a purge for a constipated child who has indeterminate intestinal pain is responsible for many cases of septic peritonitis. If the records were available of all the cases of appendicular abscess due to castor oil, they would form an interesting collection. In the catarrhal type complete rest to the bowel should be the rule, nothing but sips of water being given by the mouth. At one time medical treatment—known as expectant treatment—was the rule, but now it is agreed that the sooner an active appendix is removed by operation the better for the patient. A succession of attacks may produce many dense adhesions, and these complicate operations undertaken later.

Operation is advisable therefore as soon as the diagnosis is made, and a course of antibiotic treatment commenced. Unfortunately many patients are seen for the first time by the surgeon when they are in a state of acute peritonitis, either with localized abscess or rapidly spreading peritonitis. Operation must be done at once in such cases. The nurse must be very careful even with the early non-suppurative cases, however, as she must remember that the slightest influence may allow the condition to "flare up." Often a patient is kept for a day or two before the operation is performed when there are signs only of catarrhal appendicitis. These patients must be nursed in bed in Fowler's position, neither aperient nor enema being allowed, and all food stopped. Sips of sterile water are permissible. The complications of abscess or peritonitis are usually easy to discern, and any doubtful point or sudden development should be reported at once. One very important point about abscess of the appendix is that the temperature may become normal and the pain may be gone, yet on operation a great volume of pus wells out. In such cases, the pulse is consistently fast.

In the case of removal of a "quiet" appendix, either a few days after the first attack or in the negative period following a succession of attacks, the operation is a simple one of cutting down on the appendix, passing a ligature round it, dividing the

vessels, and cutting off the appendix, as close to the caecum as possible. The wound heals by first intention and the patient is generally up on the 3rd day. The commonest emergency operation is that of opening the abdomen and discovery of a perforated or gangrenous appendix in the centre of an abscess. A rubber tube is quickly tied in, the area being repaired as much as possible in the circumstances and anti-gas gangrene serum is given and antibiotic treatment (usually streptomycin) instituted. For days or weeks the pus pours from the abdomen, but ultimately it dries up and then the wound can be allowed to close. The usual method of after-treatment should be followed. An enema is generally given on the 2nd day, and on the 3rd and subsequent days some gentle aperient, or a mild saline first thing in the morning, followed by plenty of water. In dressing the wound, the nurse may have to remove the rubber tube at intervals and insert a shorter one, since the healing takes place from the bottom.

Complications.—The following complications must be watched for. Spreading abscess due to improper drainage (pocketing of pus); advance of peritonitis; passage of bowel contents through the stump of the appendix (faecal fistula); adhesions causing obstruction at the ileocaecal valve; abscess under the diaphragm (subphrenic abscess); pleurisy or empyema on the right side. In each case appropriate measures must be adopted in an effort to counteract the complication.

Acute Peritonitis

Peritonitis of restricted type accompanies most acute diseases of the abdomen, but in many cases it is a transient reaction, quickly passing off. The peritoneum is so sensitive to handling, to the variations of disease and to bacteria themselves that it reacts at once. We may have acute suppurative varieties and chronic serous varieties, and the disease may be localized by adhesions or diffusely scattered over the whole peritoneum.

Causes.—The organisms responsible may be the bacillus coli, streptococcus, pneumococcus, gonococcus, or the bacillus of tuberculosis. General causes are rupture of a part of the intestine as mentioned in the previous pages, rupture of the gallbladder or urinary bladder, septicaemia or pyaemia and injury.

Types.—1. *Acute Diffuse Peritonitis.*—Beginning as a local infection, this may cause pain, tenderness and rigidity of the area affected, but commonly the pain is most marked at the umbilicus. When the condition has become generalized the following picture is presented. The patient shows by his face that he is apprehensive of even the slightest movement of the inflamed surfaces of the peritoneum. He therefore lies in bed with the knees drawn



FIG. 28.—SCUDDER'S STOMACH FORCEPS.

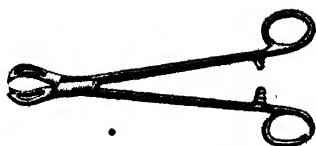


FIG. 29.—LANE'S TISSUE FORCEPS.

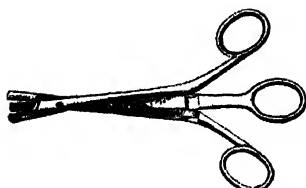


FIG. 30.—PANNETT'S PERITONEUM FORCEPS.



FIG. 31.—KELLY'S APPENDICETOMY FORCEPS.



FIG. 32.—CORNER'S APPENDICETOMY FORCEPS.

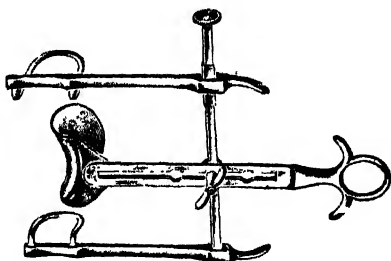


FIG. 33.—KELLY'S RETRACTOR.

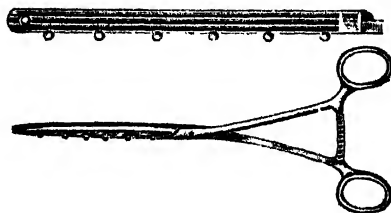


FIG. 34.—INTESTINE FORCEPS (KOCHER-PAYR).

(By courtesy of the Surgical Manufacturing Co., Ltd., London.)

up and breathes in very shallow fashion. Vomiting of a peculiarly effortless type is common, and there may be persistent hic-cough. The abdomen gradually swells, constipation is a feature and micturition may be difficult. To begin with the temperature is above normal and the pulse increased, but as the condition becomes established the abdomen is bulged out, the pain passes off owing to the mechanical effect of the fluid in keeping the inflamed surfaces apart and while temperature becomes sub-normal, the pulse is faster and weaker. The patient is in a state very similar to that of the typhoid state, with cold skin, dull expression, hollow eyes and furred tongue—the “hallmarks” of severe toxæmia.

In diffuse peritonitis the treatment is that of any other acute abdominal condition, prompt surgical measures being adopted as a rule: the abdomen is opened, free fluid and pus are evacuated and a suprapubic drainage tube is inserted into the peritoneal cavity, and the patient thereafter nursed in the Fowler position to institute free drainage. Antibiotics, usually penicillin and streptomycin, are given, and shock is counteracted by the usual thermal remedies. Vomiting is treated by aspiration of the stomach contents at regular intervals with a 40 c.cm. syringe, or continuously by electrical suction apparatus through a Ryle's tube or small oesophageal tube passed into the stomach by the nasal route and strapped to the cheek. The patient may now drink measured quantities of sterile water *ad lib* and is thus spared the extreme thirst and disagreeable vomiting once so distressing in these cases.

All fluid aspirated is carefully measured, so that the balance of fluids in the body may be maintained. This is controlled by the administration of continuous intravenous saline with glucose, which must always be given in conjunction with the above treatment. The condition is a dangerous one at the best.

2. *Acute Local Non-suppurative Peritonitis*.—This is the type which is found in long-standing gastric ulcers and chronic appendicitis, the adhesions ultimately becoming a menace owing to the danger of bowel strangulation. Rest and application of hot stupes may ease the condition, but ultimately an operation must be done to divide the adhesions.

3. *Acute Local Suppurative Peritonitis*.—As mentioned above this may spread to become the diffuse type, but in many cases the pus is held up by the adhesion of the tissues to form a natural chamber for it. The appendicular abscess is a typical example. If not opened in time the abscess may perforate the rectum, bladder or pleura. The treatment is by prompt operation, as already described. In rare cases the abscess points externally and forms a fistula.

4. *Tuberculous Peritonitis*.—Usually this is found in children,

and may follow tuberculosis of the intestine or some lesion elsewhere. Three forms are known in which there is either excess of fluid (ascites), or marked fibrosis, matting the omentum and other tissues together, or ulceration, with or without external fistula. The features of this condition are its gradual onset, with slowly developing debility, loss of flesh and constipation alternating with diarrhoea. The large abdomen of the child contrasts markedly with the spareness of the face and figure. In such cases the conservative method of dealing with tuberculosis by fresh air, special diet, and all the other accepted remedies, should be tried. If this fails, an incision to let out the fluid or to divide adhesions may be successful.

Subphrenic Abscess.—This, as its name implies, is a collection of pus lying below the diaphragm, usually the result of a perforated peptic ulcer. Pus from an appendix abscess may also travel up as far as the diaphragm. It may also be the result of liver, gallbladder, costal, renal or pleuritic suppuration. The symptoms and signs are much the same as those of any other abdominal abscess, the local nature of the symptoms and signs indicating the area of suppuration. The danger is that the abscess may burst internally or externally. The treatment consists of drainage in front; occasionally it is necessary to drain the lumbar region, in the 9th intercostal space.

Hernia

Hernia means the protrusion of part of the abdominal contents beyond the limits of the abdominal cavity. There are certain common types, named according to the situation of the hernia. The popular name for hernia is rupture.

Varieties.—Hernia may occur through the diaphragm, the sciatic notch, the obturator foramen and certain other apertures, but these occurrences are rare. The commonest types are as stated below.

1. *Inguinal Hernia.*—Commonest in males. The protrusion of omentum or of bowel and omentum takes place through the inguinal canal.

2. *Femoral Hernia.*—Usually occurs in women who have had several pregnancies. The hernia follows the femoral canal.

3. *Umbilical Hernia.*—This is discovered usually in infants and is the result of some strain on a weak umbilicus, often following a period of constipation or of vigorous crying. In adults it is due to weakness of the abdominal wall together with prolonged strain, e.g. that of childbirth.

4. *Ventral Hernia.*—In this condition the primary cause may be weakness of any part, usually the linea alba, but a ventral hernia may also follow when an operation scar is thin and weak.

Causes.—The first important point to understand is that congenitally there may be defect of the abdominal end of the inguinal canal; this may take various forms, but the outcome is the filling up of the canal sooner or later with visceral elements. An undescended testis, phimosis with strain during micturition and other abnormal congenital conditions may accentuate the condition. Hernia may also be acquired, but it is questionable whether in most of the cases there is not some inherited weakness of the site. Whether or no, any influence that increases the intra-abdominal pressure (over-strain, heavy lifts, abnormal muscular efforts, constant explosive coughing as in bronchitis, straining at stool or during micturition and pregnancy) may give rise to the well-known condition.

Symptoms and Signs.—Some discomfort, with a marked egg-like swelling in the groin or at the umbilicus, is present. A hernia may be reducible, i.e. it may be possible to press the viscus back into the cavity, and then the characteristic sign is an impulse against the finger when the patient coughs. If it is impossible to replace the hernia it is said to be irreducible.

Treatment.—Despite the many appliances devised for the reduction and “cure” of hernia by truss, there is nothing to be compared with the success of the simple operative method. A truss has many disadvantages; it may be uncomfortable, it may not fit properly and it may cause pressure symptoms. The radical cure is by operation. In children it is a matter of a few minutes on the operating table and a few days in bed. In adults the surgeon cuts down on the hernial sac, replaces the contents in the abdomen, then ties the peritoneal bag as far up as possible. The muscles are closed by reinforcing sutures and the skin is united without drainage. In 99 per cent of cases, the patient is all right again in a fortnight, but should avoid strain for a few months. The nursing of such persons is an easy matter, the only precautions being the avoidance of strain by position or by coughing in the first few days after operation. It is usual to support the knees by a pillow, and to bandage the groin with strips of elastoplast applied at right angles to the incision. Movement is encouraged and exercises are commenced. At the end of the first week, when the stitches are removed, the patient may be allowed to move with greater freedom. The only difficulties may be those of most abdominal operations viz. post-operative sickness, which in hernial conditions is occasionally obstinate, and inability to pass urine; so far as the former is concerned, with modern methods of anaesthesia, such complications become less and less probable; with regard to the latter, as the operation is close to the bladder and has a reflex effect, there is often great difficulty in male patients, but application of heat and the other remedies mentioned elsewhere may be effective.

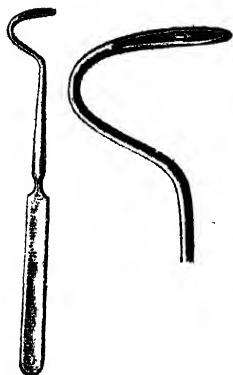


FIG. 35.—WATSON
CHEYNE'S HERNIA
NEEDLE.



FIG. 36.—HERNIA BISTOURY.

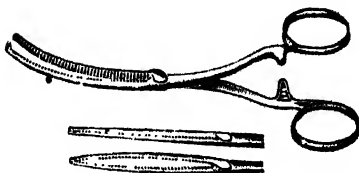


FIG. 37.—KOCHER'S HERNIA FORCEPS.



FIG. 38.—KEY'S HERNIA DIRECTOR.

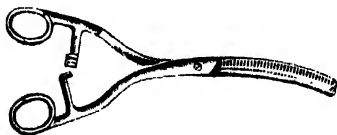


FIG. 39.—KOCHER'S CURVED BOWEL
CLAMPS.



FIG. 40.—KOCHER'S CURVED INTESTINE
FORCEPS.

(By courtesy of the Surgical Manufacturing Co., Ltd., London.)

The treatment of congenital hernia begins with an attempt to keep the viscera in position by the use of a double wool truss which is looped round the groin after the thumb has been placed over the inguinal canal to make sure that the reduction is complete. The skein of wool has to be renewed twice daily as it becomes soiled, and care should be taken that the hernia does not descend during the changing process. Although this method, as well as the method of using a rubber truss, is satisfactory in some cases, it is the experience of most doctors that early operation is much more satisfactory. There is necessary only the smallest incision and permanent rectification can be quickly made; therefore the operation is to be recommended almost universally. The post-operative condition demands quietude and avoidance of bouts of crying or the occurrence of constipation. The dressings should be protected by a square of jaconet or of G.P. tissue, a hole being left through which the penis protrudes. This keeps the dressing dry.

Children with umbilical hernia may be treated by rolling up a penny or larger coin in gauze and strapping it to the site of the hernia so that constant pressure is maintained. If this be a failure after a few months' trial, the operation may be performed.

Strangulated Hernia

There are various abnormal conditions of hernia, such as inflamed hernia, generally the result of accident, and treated by rest and fomentations; obstructed hernia, the result of impacted faeces or of a kink, and generally cleared by giving a series of large enemias; irreducible hernia, the result of adhesions caused by mild local inflammation and usually dealt with by operation. The most important condition of unusual type, however, is strangulated hernia.

In this last condition there is so much pressure on the inner ring that the circulation in the bowel is slowed and finally stopped. Knowing how gangrene is caused, we can realize that such a condition is possible in this case, and this, indeed, is what happens unless the operation is speedily performed. Strangulated hernia is often the result of some long-established and, probably, neglected hernia, but it may be the result of a sudden further addition to the hernial sac.

The symptoms and signs are those of sudden pain and severe shock, with vomiting of faecal smelling material maybe, especially when the condition has been allowed to go on too long. The danger of strangulated hernia is that of moist oedematous gangrene, so that the mass in the hernial sac swells out and makes the pressure more severe. This gives rise to complete anaemia of the part, and it is quite usual to find a bluish-black loop of bowel

in a state of acute peritonitis when the sac is opened. The patient may have severe exhaustion and great toxæmia, from which death is to be expected unless immediate operation be performed. The operation is full of difficulty owing to the fact that the hernia may be represented by a great swollen and discoloured mass which may not be suitable for replacement. In some cases it is possible to reduce the swelling by pressure, but often a resection of the bowel is necessary and end-to-end anastomosis is performed while the constricting elements are divided outside the peritoneum, this requiring special hernia directors and bistouries.

Treatment afterwards consists of stomach-washing, gastric aspiration and general measures to reduce the toxæmia. The dangers of gangrenous ulceration and of septic peritonitis must always be borne in mind; for this reason gas gangrene serum is often given on the completion of the operation. The nursing of all cases of strangulated hernia is always very exacting and in a number of cases a fatal termination has to be recorded, despite all the attention and skill employed. The radical operation is done later.

Intestinal Obstruction

There are many types of intestinal obstruction, acute and chronic, but every case shows symptoms which depend upon the accumulation of faeces and other intestinal contents, this being further complicated by formation of gas. The constitutional effect is one of severe toxæmia, often terminating fatally. In acute cases there is pain proceeding from either a strangulated portion or from the muscles of the intestines which make an excessive peristaltic effort to try to overcome the obstruction. As we noted above, vomiting begins with rejection of gastric contents, but this gradually passes on to a state of faeculent vomiting. Unless the condition is dealt with promptly, death ensues as a result of the gangrene and the septic peritonitis, both causing a powerful infective absorption into the blood.

Intestinal obstruction may be grouped into mechanical or inflammatory types. It may be acute or chronic.

Acute Obstruction.—*Causes.*—Inflammation causing adhesions or fibrous bands may constrict or strangle the bowel; or the loop of intestine may pass through a small opening (see strangulated hernia, p. 62). The condition may grow very gradually until the acute state is produced. Again the bowel may twist on itself (volvulus) or one portion may invaginate the next (intussusception). Now and then a kink forms and holds the contents back, or a large foreign body may act as a plug; foreign bodies causing acute obstruction will be impacted in the small intestine

—probably the ileum. Gallstones occasionally cause obstruction in this manner. Finally, acute peritonitis may be so marked that it leads to an obstructive state.

Symptoms.—These are described above. In most cases the sudden pain, referred to the umbilicus, the shock and the vomiting are typical. Non-treated cases show increasing abdominal distension and death occurs in a little over a week. The bowels rarely act after the first day, no flatus is passed and x-rays show numerous fluid levels throughout the small intestine.

Treatment.—Aspiration of the contents of the stomach and duodenum is carried out as a preliminary to operation. Alternatively the Miller-Abbott double lumen tube can be used;

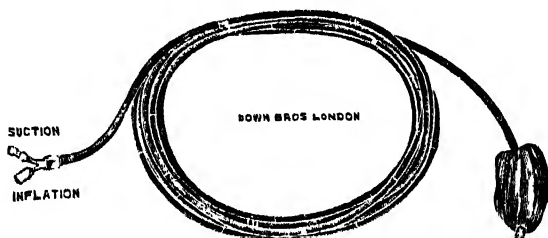


FIG. 41.—MILLER-ABBOTT TUBE.

(By courtesy of Messrs. Down Bros. Ltd., London.)

this has a rubber sac at the end, which can be inflated after it enters the duodenum; as fluid is aspirated from the intestine, the tube is gradually pushed along until the obstruction is reached (Fig. 41). This enables the surgeon to carry out the operation in the absence of large amounts of fluid, and so facilitates his work and increases the patient's chances of recovery. The nurse should note whether flatus has been passed. In the theatre, the surgeon exposes the condition and depending upon his findings tries to make the canal clear again. Volvulus is relieved by unwinding the twisted portion of bowel. In the case of mechanical obstruction by foreign bodies as mentioned above, treatment consists in intestinal incision, removal of foreign body and resuture. All that can be done in many cases is the opening of the bowel above the obstruction, the emptying of its contents and the tying in of a Paul's tube which drains the intestine externally, the wound being lightly sutured. If the patient survives, a complete operation may be done later. In early cases it may be possible to relieve the obstruction completely. In complete obstruction due to a growth of the colon or rectum, the caecum or descending colon is brought to the surface of the abdomen and sutured there. An incision is at once made into the bowel, and a Paul's drainage tube inserted into the proximal

orifice and tied in by a ligature. When possible, the growth is resected at a later stage.

Chronic Obstruction.—*Causes.*—Slowly developing obstruction occurs as a result of the increasing pressure externally of tumours or adhesions, of new growths of the intestinal wall which narrow the lumen, or of foreign bodies or massive amounts of impacted faeces inside the bowel.

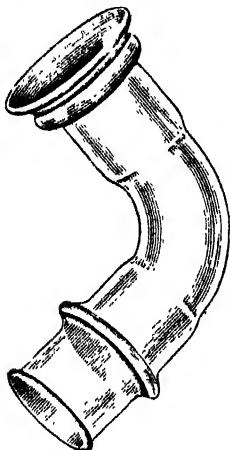


FIG. 42.—PAUL'S GLASS
COLOSTOMY TUBES.

(By courtesy of the Surgical Manufacturing Co., Ltd., London.)



FIG. 43.—COLOSTOMY CUP.

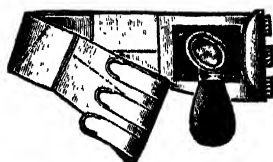


FIG. 44.—COLOSTOMY BELT
WITH ATTACHED CUP AND
BAG.

Symptoms.—The symptoms are much the same as those mentioned above, except that the condition develops slowly and there is ample warning of the final acute obstruction, if indeed that is allowed to happen.

Treatment.—The classical operations consist of complete resection of the bowel, followed by end-to-end or side-to-side anastomosis, or the formation of an artificial anus immediately above the obstruction and usually opening on the left side of the abdomen. This operation of colostomy may also be done for chronic obstructive conditions, such as cancer of the rectum or volvulus of the sigmoid flexure. It may be a temporary measure to drain the faeces externally until a passage can be made to replace the normal channel or it may be permanent in massive irremovable new growths. The temporary orifice is made by fixing the colon to the abdominal wall and making a small opening. The permanent colostomy opening is made in 2 stages. First the loop of bowel is exposed on the surface, stitched to the edges of the wound and left in position for 3 days, a small glass rod acting as transverse beam to support the bowel. On the 3rd day, an

incision is made into the intestine, and through the orifice is passed a Paul's drainage tube (Fig. 42), which is simply a glass joint connecting the intestine with a rubber pipe passing into a bucket containing disinfectant. The bowel functions in this way for about a week (second stage). The next stage of colostomy treatment consists of taking away the Paul's tube on the 7th day, and on the 8th day the fringed "cuff" of intestine is trimmed so that it just forms a ring round the skin aperture, and this makes an artificial anus. To begin with, ample cotton wool is applied to collect the faeces, which are usually fluid since the diet is generally liquid and ample supply of aperient medicine is given. Antiseptic ointment is spread over the skin until it is healed. Four or five weeks pass before the condition settles down, and the fitting of a cup over the orifice or of a colostomy belt and cup is possible (see Figs. 43 and 44). The nurse's duty is to see that not only is the upper tube functioning well, but that the lower part is kept clean by regular irrigation. Various complications may occur, such as atony of the bowel, hernia of the small intestine, localized peritonitis or closing of the orifice. Each of these requires special attention, usually of an operative nature.

Intussusception.—In this condition the upper portion of the bowel passes into the lower portion as shown in Fig. 45. A model can be made by taking the finger of an ordinary glove and pressing the point inwards with a pencil; it will be noted that there is

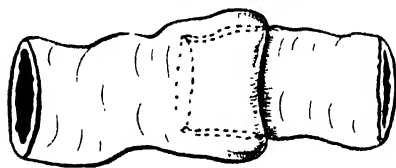


FIG. 45.—INTUSSUSCEPTION.

One part of the bowel is invaginated with the other.

(By courtesy of the Surgical Manufacturing Co., Ltd., London.)

an external ensheathing layer, an inner entering layer and a middle returning layer.

Causes.—Anything which causes intestinal irritability may cause intussusception, so that it follows improper dieting or diarrhoea in children, in whom it occurs most frequently during

the first year. Adults suffer from it when there are polypoid growths on the inner lining of the bowel. Various parts of the bowel may be affected, but chiefly the ilcoecal valve.

Symptoms.—The acute condition begins as usual with pain and vomiting. The child cries out when the spasms occur and lies with his knees fully flexed on the abdomen, which is usually very hard and shows a sausage-like swelling on the right side of the abdomen. There is tenesmus (straining at stool with blood) and collapse may quickly follow. In the chronic type the onset is more gradual, attacks of diarrhoea of colicky type, with blood-stained stools, being the rule.

Treatment.—Intussusception constitutes a grave emergency and treatment must be immediate. It is the practice to try to reduce it by high enemata before opening the peritoneal cavity.

The child is prepared for operation and the anaesthetic is given, then a saline enema is introduced by the tube and funnel method, the operator using an unlubricated catheter and squeezing the buttocks together so that the pressure required is not lost by any escape of fluid. The saline is run into the bowel for about 3 minutes; then it is siphoned back. This procedure is repeated 3 or 4 times; reduction is manifested by the presence of faeces in the fluid. Barium enemata are now frequently used in this manner, and reduction is ascertained by frequent x-ray examinations during the procedure. If the surgeon is not satisfied that the object has been achieved, the abdomen is opened, and the intussusception is manually reduced.

Haemorrhoids

When the veins in the neighbourhood of the anus are varicose, we have the condition of piles or haemorrhoids. External piles occur around the anal margin and form tense blue swellings covered by skin; internal piles are usually multiple and are found in the lower 2 inches of the rectum; they are covered with mucous membrane.

Causes.—A congested liver causes dilatation of the veins at the lowest part of the portal circulation. This condition is liable at any time to inflammation and to the development of piles. Thus chronic constipation, straining at stool, internal tumours of the abdomen or cirrhosis of the liver may set up the acute condition, which is also associated with sitting on a cold draughty water closet or on wet grass or stone. Alcoholism may give rise to the inflammation. Both internal and external piles may occur at the same time.

Symptoms.—External piles become the site of thrombosis and cause itch and pain; they may suppurate. One attack may pass off, but it leaves the condition worse than before. Internal piles swell up and become slightly pendulous. After defaecation, especially when there is any pain, the patient finds that the piles protrude. If left in this state they become very inflamed and painful, and often irreducible; a cure may be effected by rupture. Generally, however, the swelling gradually resolves. Even although there may be no external evidence of piles, it must be assumed that they are present when there is slight bleeding when the patient goes to stool. A typical attack of piles shows a few deep blue and distended blebs protruding from the inner aspect of the anus; they have the appearance of being liable to burst at the slightest strain and they cause great pain. The attack is one

of local phlebitis. In the event of suppuration, pyaemia may occur, but this is rare.

Treatment.—Assuming in both cases that the primary causes have been appreciated and effectively dealt with, there is a conservative, an operative, and an injectional form of treatment. The first consists of careful toilet of the area, using plenty of soap

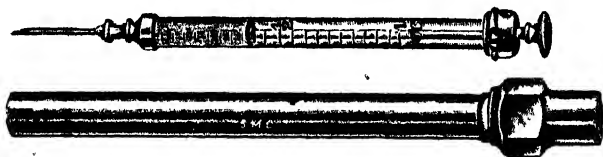


FIG. 46.—HAEMORRHOIDAL SYRINGE.

(By courtesy of the Surgical Manufacturing Co., Ltd., London.)

and warm water and gently replacing the piles with the finger if necessary. After this a soothing and astringent ointment should be applied. In very acute cases, rest in bed, with the application of moist fomentations, may bring relief. The second method involves operation to ligature, or to dissect out, or to clamp and cauterize the piles or to remove completely the affected area by Whitehead's operation. The most modern form of treatment is that of injections of 10 per cent phenol in glycerine, 2 to 6 injections being given at intervals with a special syringe; this often results in a very successful cure. The after-treatment consists in keeping the bowels constipated for about 5 days, after which a brisk purge is given. The area may be dressed for a week with ichthyol and glycerine. In some cases piles are associated with fissure of the anus; this is a small, very painful ulcer in one of the folds, accompanied by a single ("sentinel") pile. Defaecation may give rise to agonizing pain and often a cocaine ointment is prescribed. Ultimately it may be necessary to excise the fissure and remove the pile.

Diseases of the Gallbladder

Medical diseases of the gallbladder have been described in Vol. III, and cancerous conditions are dealt with under "Neoplasms," later on (Chap. 7), therefore our studies at present are limited to cholecystitis (inflammation of the gallbladder) and cholelithiasis (gallstones).

Cholecystitis.—This condition may be the forerunner or the sequel to gallstones. In the former case, increasing catarrh leads up to the formation of gallstones. In the latter, which may also be the result of *B. coli* or *B. typhosus*, the condition is acute or chronic. The acute type is characterized by inflammation of the

gallbladder, which usually affects the surrounding peritoneum. Generally an abscess forms and this demands surgical treatment. The symptoms are those of acute peritonitis with encysted abscess, which, however, may perforate the gallbladder. Pain and tenderness over the lower region of the liver, attacks of colic and general malaise lead to rigors, high fever, shock and the usual train of abdominal symptoms already studied.

Cholelithiasis.—Gallstones may occur singly, beginning as a speck of mucus which takes on layer after layer of bile salts and pigments, or cholesterol, and which may ultimately occupy the whole gallbladder. More commonly they are multiple, being crushed together like the sand in a hen's gizzard, or if they are of larger size, appearing like closely packed gravelstones with facets.

Causes.—Gallstones are generally found in women of middle age who have had a family, as pregnancy tends to increase the liability to their development. "Fair, fat, fertile and forty," is the mnemonic generally taught in both medical and nursing schools. The causes of cholecystitis are also those of gallstones.

Symptoms.—The development may be so insidious that nothing is complained of. There may be tenderness at the lowest part of the thorax on the right side just over the site of the gallbladder, and sometimes mild attacks of colic in the same situation after meals. The outstanding symptoms are produced when a gallstone attempts to pass through the bile duct. The pain is almost as severe as that of renal colic; it radiates to the right shoulder and to the back and causes sickness, vomiting and collapse. The pain terminates either when the stone slips back into the gallbladder or moves on into the intestine. Depending upon the obstruction, there is a variable amount of jaundice, which passes off in a few days. There is always a yellowish element in the complexions of those who suffer from gallstones, however. The great danger of gallstones is the setting up of mechanical irritation with subsequent inflammation, suppuration, perforation and peritoneal abscess. When a stone becomes impacted in the duct it may have to be removed by operation.

Treatment.—During an attack of gallstone colic, the patient requires to be treated with hot fomentations, or she may be immersed in a very hot bath, after which morphine and atropine may be administered. The medical treatment of gallstones, namely, the routine of a fat-free diet, plenty of exercise, regular salines by the mouth and a course of antiseptics such as urotropine, is not very successful.

The operative treatment depends upon the nature of the condition.

With the exception of the few cases which require immediate surgical treatment, patients who are to undergo gallbladder

operations nowadays have special treatment in preparation, lasting 1 or 2 weeks, during which they are given liberal amounts of glucose, so that the liver may have a good store of this substance, and calcium and vitamin K (the latter being given intramuscularly), because of the great tendency of these cases to haemorrhage owing to disturbance of the functions of the liver.

1. In cholecystostomy, the gallbladder is opened, the stones, if present, and abscess contents are cleared out, then the surgeon ties in a small drainage tube at the fundus; this is removed when mucus only is passing from the gallbladder. This operation is performed in acute cholecystitis, when there is danger of rupture of the gallbladder, which is distended with pus. When the inflammation is fully subsided, in 3 to 6 months' time, the gallbladder is removed.

2. In cholecystectomy the whole gallbladder is removed, leaving a ligatured stump at the cystic duct. This operation may be done for many other conditions, e.g. cancer, and it is the best way to stop the irritant processes at work. Many surgeons remove the appendix also, since it is often affected. A recent development is Korek's method of cholecystectomy, by which the stones are removed and the free part of the gallbladder excised, while the inner lining of the portion attached to the liver is coagulated by diathermy; this prevents bile from seeping into the peritoneal cavity.

3. Cholecystenterostomy is the making of a direct passage from the gallbladder into the duodenum, and is adopted when the duct is blocked by a stone, and cholecystogastrostomy is a similar opening into the stomach, performed along with the operation of partial pancreatectomy for early carcinoma of the head of pancreas or ampulla of Vater, or as a palliative operation when these conditions are inoperable.

4. Choledochotomy is the operation performed for the removal of stones from the common bile duct. The duct is incised and probed, the stones removed, then a T-shaped drainage tube inserted, the long end of which is later drained into a sterile bottle.

5. Cholangiograms are x-ray films of the bile ducts obtained by injecting an opaque substance into the above T-tube about ten days after choledochotomy is performed in order to ascertain that there are no further stones in the common bile duct, and that no obstruction, e.g. stricture, carcinoma, etc., is present.

In addition to the above we must not forget that in many cases there is the surgical treatment of cholecystitis to be considered. This amounts to the treatment of local peritonitis of the septic type described previously.

After-treatment involves the giving of an intravenous injection of calcium chloride if the blood shows reluctance to clot and gives

rise to haemorrhages. The nurse in charge of a gallstone case should see that the rubber tube which passes from the gallbladder into a small glass bottle set in the bed at the patient's right side does not become obstructed, and it is of the utmost importance for the nurse to remember that this tube must not be removed without the surgeon's permission. The discharge should always be saved, also the urine and faeces, in order that an assessment may be made of bile function. Most patients are nursed in the semi-recumbent position, or even in Fowler's position, as there is usually a small peritoneal drain also. The drain should have been dispensed with by the end of a period of from 7 to 8 days. After a preliminary enema on the 2nd day, magnesium sulphate or sodium sulphate should be given on the 3rd day, this flushing out the bowel with a watery motion.

Any complications should be reported at once. Haemorrhage requires further injection of calcium chloride or local styptic measures. The peritoneal condition may develop instead of resolve; this may lead to many serious signs of toxæmia and collapse. In some cases the bile continues to flow and forms a biliary fistula, which continues indefinitely when there is a stone blocking the bile duct; this necessitates another operation.

Injury to the Liver.—The liver occasionally suffers rupture, usually due to violent accidents, but sometimes through quite simple ones, e.g. a child falling against the side of his bath. Treatment is immediate operation and the insertion of deep mattress sutures into the liver substance and latterly the application of fibrin foam to the cut surface of the liver has given good results; blood transfusion and treatment for shock are carried out as a routine. These patients are always extremely ill and require most careful nursing. The mortality rate is high.

Diseases of the Urinary Organs

Whereas in the section of Medical Nursing, diseases of the urinary organs as dealt with by the physician were discussed, it is at this point that the surgical aspects should be considered. At the same time it must be kept in mind that often both the physician and the surgeon have to collaborate.

Pyelitis

Pyelitis is best regarded as a surgical disease. The condition is one of inflammation of the pelvis of the kidney, usually caused by the *B. coli*. The latter may gain a foothold owing to the presence of calculi or they may spread from the bladder or urethra; they may reach the kidney by embolic methods or by the blood laden with germs from the intestine when the latter is the site of toxic



FIG. 47.—MOYNIHAN'S GALLSTONE SCOOP AND PROBE.



FIG. 48 —CHEATLE'S GALLSTONE SCOOP AND HOOK.

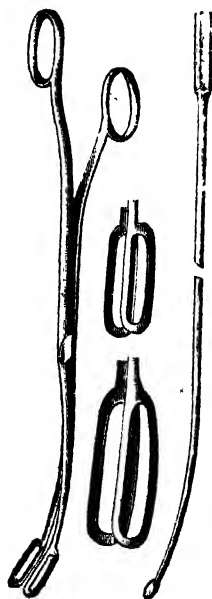


FIG. 49.—DESJARDIN'S GALLSTONE FORCEPS AND PROBE.

(By courtesy of the Surgical Manufacturing Co., Ltd., London.)

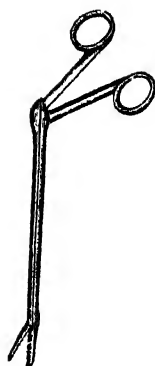


FIG. 50.—THOMSON-WALKER'S KIDNEY PEDICLE FORCEPS.



FIG. 51.—GALLSTONE FORCEPS WITH CROCODILE MOUTH.

states such as piles, appendicitis, cholecystitis, chronic constipation and so on. Pyelitis may also be caused by T.B., or by the taking of irritating drugs such as turpentine or cantharides.

Course.—The discharge of pus may be mixed with mucus, and may be limited to the pelvic lining. Various developments occur as the disease progresses, these being enumerated below.

1. *Simple Pyelitis (Acute).*—In addition to the pain and tenderness, rise of temperature to 102° F. or 103° F., rigors, irritability, and even delirium, there is pus and albumin in an acid urine, which teems with *B. coli*. In this case sulphonamide therapy is of great value, as the drugs are excreted by the kidneys. Sulphapyridine in the usual dosage combined with alkalis and copious fluids, rapidly renders the urine alkaline and clears up the infection, and the condition of chronic pyelitis, once common, now rarely occurs.

2. *Chronic Pyelitis.*—This has been referred to above. Antibiotic treatment should be continued. The condition may persist for a long time, and may require constant administration of alkaline and antiseptic medicine.

3. *Pyelonephritis.*—In this, the disease spreads to the substance of the kidney. Generally there is rapid development of pyrexia, with rigors, onset of the typhoid state and death from septic poisoning or uraemia in a few weeks. Alternatively, the course may be less dramatic, but may terminate in death from toxæmia after a much longer period of illness. The giving of copious fluids containing large amounts of glucose is a most essential point to be observed when nursing patients with this condition.

4. *Pyonephrosis.*—This is the condition in which there is a collection of pus in the pelvis of the kidney, so that for all practical purposes the space is an abscess cavity. Enlargement and tenderness of one or both kidneys give rise to swinging temperatures and great debility; the urine is replaced almost entirely by pus. Death may occur from septicaemia or pyaemia, but many cures have been effected since the sulphonamide drugs were introduced.

5. *Perinephric Suppuration.*—This may be the result of complete domination of the kidney substance by pyogenic organisms, the spread occurring from within outwards, but it may also take place from other abdominal organs e.g. the peritoneum. The abscess may point externally and burst.

Treatment.—Pyelonephritis and pyonephrosis often clear up when treated with sulphonamides or antibiotics, and copious fluids and by careful nursing; but perinephric suppuration invariably requires to have surgical treatment.

Operative Measures.—It is obvious that very drastic measures must promptly be adopted, when feasible, in septic conditions of the kidney which do not yield to sulphonamide therapy.

In severe pyelonephritis, when the urine ceases the operation

of nephrostomy is undertaken. The kidney is opened and drained and a tube left in position. In pyonephrosis, nephrotomy (simple opening of the kidney, removal of foreign body, cleansing, and closure) may be done, but it is nearly always necessary to do the former operation. In the case of severe abscess or advanced disease, the kidney may have to be removed entirely by the operation of nephrectomy. In perinephric suppuration, ordinary drainage from the area may be successful.

The condition of the patient is always very critical after such operations, the shock and toxæmia being great drawbacks. Nurses must understand that they are often fighting with a forlorn hope, but every effort should be made to get rid of the septic invasion by salines, fluids and all the other methods of treatment.

Calculus

Stone in the kidney is a disease which is due to the formation of hard masses of various size derived from the solids in the urine. The symptoms of the disease depend upon the irritation set up by these foreign bodies.

Vesical calculus, or stone in the bladder, gives rise to much the same symptoms as renal calculus, but the pain is felt, as stated previously, at the end of micturition and at the point of the penis. The bleeding is fresher than that from the kidney. The x-ray film clinches the diagnosis. A bougie passed into the bladder may encounter the hard mass and the cystoscope proves its type.

Renal Calculus.—This may be discussed first; it is regarded by some as a medical condition.

Causes.—The explanation of this phenomenon is that, in certain circumstances of metabolism, the blood is overcharged with waste matter, and the result is that the urine in the pelvis of the kidney is in excessive concentration. Various solids are deposited and may agglomerate into masses ranging in size from that of a millet seed to that of a plum. The record stone is about 3 pounds in weight, but this is a rarity. Many start by a centre formed of a small clot of blood, a tube-cast, a minute ball of mucus or even a colony of bacteria.

Often the cause is overeating, associated as it is with increase of urinary acidity; excessive consumption of alcohol may also be a cause. Lack of exercise may be a factor, but stone in the kidney often occurs in those of very active habits. It is commoner in males than in females, and usually occurs after the age of 40.

Varieties.—The following types of calculus may be found.

1. **Uric Acid Calculi.**—The commonest type; layers are deposited concentrically until a stone is formed like a pebble, and which, when cut across, shows rings indicating successive layers. These calculi are hard, very smooth and of reddish-brown

colour; if there are several, cramped together in the pelvis of the kidney, they show facets on their surfaces, like the bones of the wrist or tarsus (Fig. 52, *a*).

2. *Oxalate of Lime Calculi*.—These are very hard, and when small are like grey grains of rice; the bigger calculi resemble mulberries. They are often found in patients who eat a good deal of rhubarb. They cause much pain (Fig. 52, *c*).

3. *Phosphate Calculi*.—Phosphates of both earthy and triple variety form huge stones, sending out knobs or processes, like a potato, into the various corners of the pelvis of the kidney. They usually occur when there is alkaline urine and pus in the kidney (Fig. 52, *b*).

4. *Mixed Calculi*.—A stone in the kidney may be formed of a mixture of uric acid and oxalate; depending on the length of time taken in development the stone may show layers of various salts.

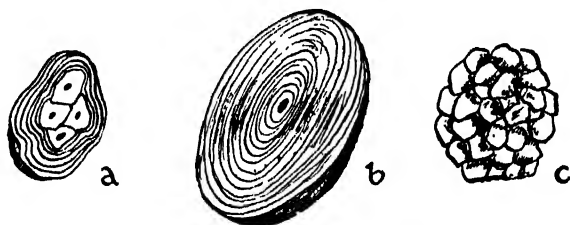


FIG. 52.—COMMON URINARY CALCULI.

a, Uric acid calculus originating by deposition of a layer of uric acid in a small flake of epithelial cells. *b*, Phosphatic calculus cut open to show concentric layers. *c*, Oxalate calculus, with typical "mulberry" outline.

Symptoms.—The symptoms of renal calculus are due to the pressure, movement and irritation of a foreign body in a very delicate and sensitive area. The stone may make matters worse for itself by setting up a septic condition of the pelvis of the kidney, pyelitis, which may infect the kidney surface and cause pyonephrosis. The urine may be held up in the pelvis of the kidney when the stone enters the ureter and forms a plug; the condition of hydronephrosis is thus caused. Generally only one kidney is affected by calculus, although bilateral disease is occasionally found.

If the stone be small, the symptoms of renal colic may be most marked. This has been described in Vol. III. The patient often faints, after turning very pale and sweating copiously. As a rule the pain quickly passes off once the calculus enters the bladder, but the stone may fail to get through, and may continue to cause excessive pain for days. Renal colic should be easily

recognized by nurses. The things to watch for are the sudden onset, severe shock, frequency of micturition, haematuria and complete relief when the calculus passes into the bladder.

When the stone is less nomadic and remains contentedly adding to its bulk in the pelvis of the kidney, the pain is of a dull, heavy character, occurring in the lumbar region on the side affected; there is tenderness on pressure over the site of the calculus. Haematuria is frequent, and it is increased if the patient does active physical work. The examination of the urine may give a clue to the type of stone. A large stone may cause milder symptoms of renal colic, but the most terrifying pain comes from the attempted passage of the smallest stones, which are usually multiple. Examination by x-ray, by the cystoscope and by various other methods help greatly in the diagnosis, but sometimes the shadow is very faint.

Cystoscopy.—By this method, the surgeon is enabled to inspect the inside of the bladder and to examine the outlets of the ureters in order to ascertain how the urine is flowing into the bladder. In all cases of doubtful bladder conditions the cystoscope is one of the most important factors in the diagnosis.

The cystoscope is constructed on the catheter principle, a metal tube being made with a small electric lamp connected to a battery and with a reflecting mirror at one end and a telescope

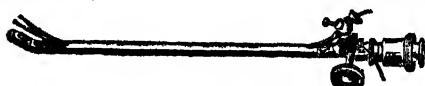


FIG. 53.—DOUBLE CATHETERIZATION
CYSTOSCOPE.

(By courtesy of the Surgical Manufacturing
Co., Ltd., London.)

lens at the other, the last forming the eyepiece. By this method the whole area of the bladder can be investigated. Modern cystoscopes are fitted with two slender catheters, one for each ureter, so that the urine can be drawn off separately as it passes down on either side from the kidneys (see Fig. 53). The routine of cystoscopy consists of a primary irrigation of the urethra and bladder with normal saline or oxycyanide of mercury, 1 in 4000, about 8 oz. being left in the bladder. The patient may be anaesthetized; sterile liquid paraffin (glycerine causes bubbles) is the best lubricant to use for the tube. After the surgeon has finished with it the cystoscope should be dismantled. The best solution for disinfection of the lamp and eyepiece is biniodide of mercury (1 in 500) or oxycyanide of mercury (1 in 4000); the latter has the advantage in that it is also an excellent lotion for bladder irrigation.

Treatment of Renal and Vesical Calculus.—*Renal Calculus.*—Operations on the kidney are performed to remove calculus or to take away the kidney as well if the calculus cannot be removed.

In some cases of very small stones, the taking of great amounts of fluid, combined with postural exercises, may dislodge the calculus by the bladder and urethra. There is always some pain and a little bleeding on the passage of a calculus, but the patient is generally delighted to get rid of it. Uric acid calculi are sometimes dissolved by an intensive course of citrates and acetates of potassium. In all renal calculus cases, abundant fluids such as barley water, soda water or plain water are indicated. An attack of renal colic is best dealt with by applying hot fomentations or by putting the patient in a hot bath. Morphine is one outstanding drug which brings relief. An operation for the removal of a calculus is called a nephrolithotomy; it is sometimes necessary to drain the kidney at the same time. Special forceps and probes are used.

The postoperative treatment consists of careful protection of the lumbar regions by provision of pillows, air cushions and other supports for the surrounding regions; the patient is usually most comfortable in the semi-recumbent position after he has recovered from the anaesthetic. If nephrostomy also has been performed he is inclined towards the side from which the kidney is being drained. It should be remembered that there is often severe vomiting and disturbing hiccough after a kidney operation and the dressings require to be changed constantly, as the urine quickly soaks the protective pads. Shock is a marked feature of all renal postoperative states, but once this is overcome the progress is usually rapid in the absence of bleeding into the ureter, which gives rise to colic, or of uraemia, which is a possibility when the flow of urine is sluggish. To stimulate the latter bland fluids or simple sterile water may be given *ad lib* for several days after the operation. A strict record must be kept of all fluids taken or vomited, and the amount of urine passed or drained, specimens of which should be saved in separate glasses, in order that the amount of haemorrhage from the kidney may be assessed by comparing the urine passed at different times of the day. In ordinary cases the patient is up in a fortnight.

Vesical Calculus.—In order to remove a vesical calculus there are 2 established procedures: 1. lithotrixy; 2. suprapubic cystotomy.

In the operation of lithotrixy, the stone is crushed by strong forceps and the portions are taken away by means of a wide evacuating tube (litholapaxy). The routine consists of preliminary bladder wash as usual, leaving 6 oz. of the lotion used in the bladder. The lithotrite is passed through the urethra with the blades closely approximated; when the stone is felt, the blades are opened by a screw mechanism (see Fig. 54) and then they are tightened until the calculus is crushed into small granules. The lithotrite is removed, an evacuating tube is substituted, and the "grounds" are washed out until the bladder is

clear. After the operation there is a little residual haemorrhage but the patient has usually quite recovered in 10 days or less. In some cases a catheter has to be left in for 48 hours, while irrigation may be necessary if there be danger of cystitis. Some diffi-

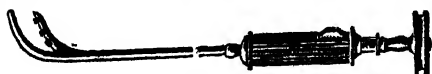


FIG. 54.—KEEGAN'S LITHOTRITE.
(By courtesy of the Surgical Manufacturing Co., Ltd., London.)

culty may be experienced for the first few days in the re-establishment of the urinary flow by natural means; this may be

overcome by the use of a sitz bath or by other heat application to the pelvic regions.

Suprapubic cystotomy is undertaken when the stone is too large or when the crushing is inadvisable. It is also the operation performed in cases of enlargement of the prostate (referred to on p. 80), in chronic cystitis requiring drainage and in tumours of the bladder.



FIG. 55.—MORSON'S BLADDER TROCAR.
(By courtesy of the Surgical Manufacturing Co., Ltd., London.)

Assuming that the usual preoperation antisepsis of the bladder has been carried out, the patient is put on the table in the Trendelenburg position and the bladder is irrigated with normal saline, 10 oz. being left in. An incision about 3 inches long is

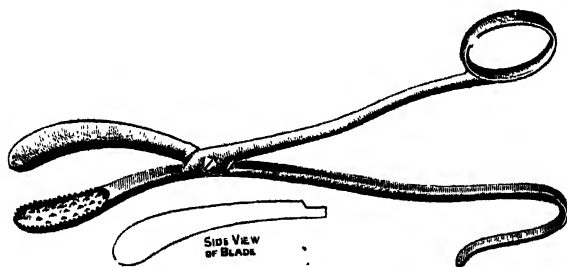


FIG. 56.—LITHOTOMY FORCEPS.
(By courtesy of the Surgical Manufacturing Co., Ltd., London.)

made upwards from the symphysis pubis, and the bladder is exposed. The stone is removed, and the bladder is closed again, but in most cases there is need of a period of drainage owing to the presence of cystitis, therefore a long rubber drainage tube is tied in and left until the effluent is sterile. There is usually

a good deal of pain after this operation and morphine is necessary. Plenty of liquids should be given. The postoperative care is important, and the patient requires much attention. The dressings, which consist of gauze smeared with a thin layer of boric acid in soft paraffin, and of thick layers of cotton wool, should be changed frequently, as they may become soaked. In order to maintain the urethral function, tidal drainage of the bladder is generally instituted. This may be effected quite simply by having an inverted flask containing the appropriate lotion suspended 2 to 3 feet above the bed; there will also be required rubber tubing, screw clip and drip glass connexion with air inlet attached to a Y-shaped glass connexion; one arm of the latter is connected by rubber tubing to another flask containing disinfectant, the other to an inverted glass U-tube placed slightly above the level of the symphysis pubis and thence to the urethral catheter (Fig. 57).

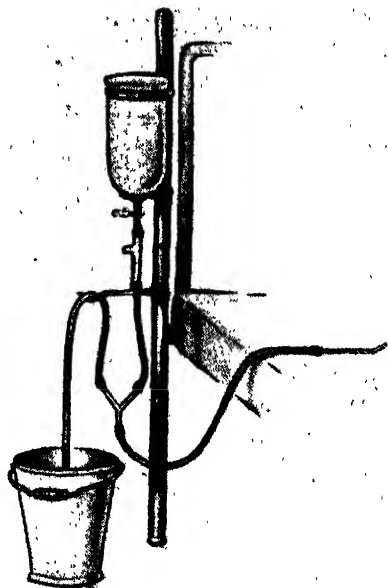


FIG. 57.—APPARATUS FOR
TIDAL DRAINAGE.

The speed of the drip is regulated to 40 drops per minute, and the bladder is automatically emptied by siphonage when its contents reach the level of the U-tube. By this method the bladder retains its muscular tone and normal micturition is often restored within a fortnight of operation.

Injuries to the Kidneys

One or both kidneys may be ruptured by direct violence to the lumbar region such as may be sustained in airplane crashes or road accidents or by a fall from a considerable height. The treatment is usually conservative—rest, administration of morphine, careful measurement and observance of all urine passed. In order to estimate the progress of the haemorrhage which is always present in these cases, specimens of urine are saved and

compared as described above, and if the bleeding does not diminish, it may be necessary to remove the kidney.

In severe cases immediate nephrectomy is necessary to save the patient's life.

Injuries of the Bladder

Occasionally the bladder is ruptured in accidents involving the pelvis. Treatment is by opening the abdomen by a suprapubic incision, suturing the bladder and draining it, either by a suprapubic drainage tube or *per urethram*. Tidal drainage is useful in this condition.

Rupture of the Urethra

This condition causes extravasation of urine into the tissues. Treatment is by incision into the bladder and by the approximation of sounds or bougies—one through the surgical opening, one *per urethram*; a self-retaining catheter is passed along the urethra to the bladder. The suprapubic incision is closed.

The ruptured ends of the urethra are then exposed from the perineum and sutured together. The urethral catheter remains *in situ* until the urethra is healed (in about a fortnight), and the bladder is irrigated during this period by tidal drainage.

Enlargement of the Prostate Gland

This complaint is very common in men over 50 years of age. Its onset is gradual and it is associated with frequency of micturition, pain and sometimes chronic cystitis. Ultimately when the gland enlarges so much that it makes the act of micturition difficult, the patient seeks the surgeon, who usually performs the operation of prostatectomy. Very few nurses go through their training without experience of one or two such cases.

Treatment.—In the operation of prostatectomy, suprapubic cystotomy may be adopted or the newer retropubic type of prostatectomy in which the bladder is not opened. The surgeon, with the index finger of his right hand, tears the mucous membrane from the internal urethral orifice, and by gentle working the prostate is “shelled out.” Immediate irrigation with a hot fluid may stop the bleeding which is considerable, and may have to be controlled in the Harris operation by suturing the prostatic bed.

After the retropubic operation, a Foley's catheter is passed *per urethram*. The inflatable bag about two inches from the end is blown up by air or sterile water introduced into the side-tube by a syringe. The side-tube is then tied or clamped as close to the lower end as possible. The catheter is removed on the 5th day,

the patient is usually passing urine normally about the 8th day, and goes home at the end of a fortnight.

Irrigation is not performed unless the bladder is grossly infected, or blood clots are interfering with drainage, when 5 per cent sodium citrate is used to dissolve them. The main nursing duties, apart from those mentioned in a subsequent paragraph, are the administration of adequate amounts of fluid, and observing and recording the amount and nature of the urine drained.

A large number of cases of enlarged prostate are due to malignant disease, and modern treatment consists in the administration of ovarian hormone, usually in the form of stilboestrol, which besides causing the disappearance of clinical signs of growth in the prostate gland, causes clinical signs of metastases in bone and elsewhere to disappear also.

It may be necessary for surgical treatment (in the form of suprapubic cystostomy to relieve retention), to be given in conjunction with hormone therapy.

Precautions.—Both before and after prostatectomy there are important items in the programme. First there is the question of the amount of urea passing from the bladder; if the tests should show this to be much under the normal it is very dangerous to operate; therefore the surgeon as a rule ordains that a preliminary drainage should be done, especially as in these cases the cystitis is marked. In this way the patient is prepared by irrigation of the bladder for a short period before the prostate is removed, and thus the risks of uraemia and toxæmia are very much reduced. He is generally given a mixture of urotropine and acid sodium phosphate for at least 10 days before the major operation. Secondly, there may be toxæmia after the operation and it may be necessary to give normal saline intravenously. The nurse should expect some hæmorrhage, but any abnormal flow should be reported. All such patients suffer from shock, and owing to their age there is the ever-threatening hypostatic pneumonia in the background; therefore as soon as possible they should be made to sit up.

Genito-Urinary Diseases

Stricture.—This condition is a narrowing of the urethral canal, usually in certain parts. The result is difficulty in micturition and even stoppage. There is the temporary spasmodic type, quickly relieved by catheterization. There is the inflammatory type, caused by gonorrhoea, for which a hot sitz bath may be indicated. Thirdly, organic stricture may result from contraction of a cicatrix. Bladder hypertrophy is the rule. The treatment consists of gradual and regular dilatation by bougies or by internal or external urethrotomy. This condition is not seen so

frequently nowadays as it was a few years ago, because of the advances made in the treatment of venereal disease; early diagnosis and effective treatment of gonorrhoea prevent the occurrence of stricture and associated diseases.

Phimosis.—This generally is a congenital condition, the child having difficulty in passing urine owing to the small orifice at the end of the long, adherent prepuce, which cannot be retracted over the glans penis. It is important for nurses to note that this second condition only applies to children over 12 months old. In infants it does not necessarily mean that the prepuce is too tight if it cannot be retracted. Inflammation and irritation are common, and the radical treatment of circumcision is one of the simplest and commonest operations of the out-patient department.

Paraphimosis.—In this condition the patient, unable to draw the foreskin forward after it has been retracted, suffers from a tight constricting ring just behind the glans penis. Oedema increases the pressure, and ulceration occurs unless the surgeon acts promptly by pressing out the fluid from the area with his two thumbs, and by drawing forward the prepuce with his index and middle fingers. Circumcision is performed as soon as the tissues are normal.

Balanitis.—Inflammation of the glans penis, generally accompanied by inflammation of the prepuce (balanoposthitis), is found in patients suffering from gonorrhoea, or in infancy from irritative lesions due to germs and dirt. The glans may swell up to twice its normal size and give rise to pain, septic discharge and ulceration. Lead lotion, applied on fine gauze between the glans and the prepuce, may reduce the activity but sometimes the prepuce has to be slit, circumcision being done later.

Circumcision.—The operation of circumcision is usually carried out by applying pressure forceps to the dorsum of the prepuce, the latter being drawn well forward. The skin is divided by scissors in the middle line posteriorly and the two flaps are cut off; the mucous membrane is then similarly dealt with. By passing a few sutures of catgut, the mucous membrane and skin are united and the larger vessels may be tied. The best dressing is one of soft paraffin and boric and of lead lotion on gauze or of hydrogen peroxide and gauze. The dressings should be prevented from sticking, and ample pads of cotton wool should be fixed on afterwards. After 2 days in bed the child should be well on the way to recovery, but since many patients are taken to unclean homes, the nurse must be prepared for slight haemorrhages, septic inflammation, best treated by moist fomentations at frequent intervals and ulceration. In the case of the latter, a weak mercurial ointment may be effective.

Abnormal Position of the Testis.—The testicle may re-

main at the internal abdominal ring or it may become stuck in the inguinal canal (undescended testicle). Otherwise the testis may be found either in the perineum or near the saphenous opening on the thigh (malposition). In all these cases, there is a danger of injury, degeneration, torsion and gangrene. Operation was once the only remedy but nowadays the condition is treated by hormones obtained from the serum or urine of pregnant mares, always provided that there is no evidence of obstruction to the passage of the testes. The preparation most frequently used is "Pregnyl," a proprietary gonadotrophic preparation; treatment may be combined with surgery.

Haematocele.—When a vessel is ruptured by injury to the testis the blood collects in the tunica vaginalis. It may organize and form a fibrous clot. Generally this condition is improved by immediate application of an ice compress or of soothing lotion, and the patient should be kept at rest, with the scrotum supported. Incision to let out the blood is sometimes necessary.

Hydrocele.—Many men suffer from this complaint, which is due to a lymphoid accumulation in the tunica vaginalis, sometimes reaching a great size. Cases become chronic, and the victims attend the doctor regularly for tapping, a trocar and cannula being employed (Fig. 58). The radical operation is often done to produce a permanent cure, the tunica being excised. The scrotum should be well supported and a suspensory bandage is essential afterwards, usually as a permanency.

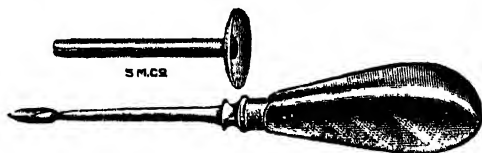


FIG. 58.—TROCAR AND CANNULA.

(By courtesy of the Surgical Manufacturing Co., Ltd., London.)

Varicocele.—When the scrotum is lax, and often when there is pressure of the sigmoid flexure on the left spermatic vein, there is a varicose condition of the network of vessels surrounding the testis and spermatic cord, so that the scrotum gives the impression to the fingers that it is a "bag of worms." Pain and discomfort lead to neurosis and very often the condition is found in highly-strung youths. The wearing of a suspensory bandage relieves the pain, but in severe cases it is necessary to perform the small operation which consists of a $1\frac{1}{4}$ -inch incision over the inguinal canal and the excision and ligature of the group of veins. Recovery is very rapid, complications being rare. The after-treatment is the same as that for hernia. A suspensory bandage should be worn for several months after the operation.

Orchitis.—Inflammation of the testis has already been referred to under the heading of mumps. The acute inflammatory swelling may also follow injury or an attack of gout. In syphilis chronic orchitis is a tertiary sign. The treatment is the same as that of epididymitis (see below).

Epididymitis.—The acute condition nearly always follows gonorrhoea; tuberculosis is usually the primary disease in the chronic condition. Pain, swelling and discomfort in the scrotal region bring the patient to the doctor. In the case of acute orchitis and epididymitis, treatment consists essentially of rest in bed, sulphonamides or antibiotics being given and the scrotum well supported; to begin with cold compresses may reduce the condition, but hot fomentations may be indicated later. The bowels should be kept loose by mercurial purges and salines. Later on in the subacute stage strapping, or support combined with pressure, are the best methods of treatment. Chronic tuberculous epididymitis and chronic orchitis should be treated according to the cause. In the tuberculous cases, castration is sometimes necessary in order to prevent spread.

Sundry other Surgical Affections

Diverticulitis.—This disease is characterized by pocketing of the colon (usually of the transverse or descending colons), the small offshoots forming bud-like projections which become filled with bacteria and faeces and cause irritation and ulceration. It occurs chiefly in middle-aged men who are victims of obstinate constipation. The bowel may perforate, since ulceration is common, and fistulas may form which pass from the bowel to the bladder or an abscess may develop in the left iliac region, with all the typical signs of peritonitis. In some cases lubrication of the bowel with an emulsion of paraffin with agar-agar and phenolphthalein will relieve the condition, but laparotomy is indicated when the abdominal symptoms become acute. Antibiotics are used in conjunction with surgical treatment.

Rectal Prolapse.—In children who suffer from constant straining due to threadworms or diarrhoea, especially after a period of constipation, the rectum may be prolapsed for 2 or 3 inches. The nurse, after gently swabbing the portion with sterile water and applying a little boric acid in soft paraffin, should press the prolapse upwards and the child should be made to rest in bed for a day or two, the motions, loosened by liquid paraffin, being passed into napkins as the child remains in the recumbent position. It may be necessary to keep the child in bed for a few weeks, the thighs being bound together and all efforts made to feed him up so that he may become fat and thus

provide a padded support for the rectum. Prolapse nearly always occurs in weakly babies.

Ischiorectal Abscess.—Owing to infection from the skin or from the interior of the bowel, and sometimes as a tuberculous manifestation, ischiorectal abscess may appear at one side of the anus, filling up the perineum with a tense swelling of acute inflammatory type. Incision and drainage combined with antibiotics is the treatment, care being taken to keep the parts clean and to apply antiseptic ointments frequently.

Fistula-in-Ano is the name given to a sinus which may take several forms, depending upon whether it opens internally or externally. It persists for a long time, causing pain and discharge, especially after a motion. It may be opened up and drained and it reacts well to ultra-violet light rays. It often has origin in an obstinate ischiorectal abscess.

Adenitis.—Apart from tuberculous lymphadenitis, the lymphatic glands of various regions may become infected and pass on to suppuration if they drain a very septic sore. Thus we may find adenitis, with fluctuating swelling, in the neck, axilla, groin and other places as a secondary manifestation of various well-known affections. The treatment is conservative; operation is resorted to nowadays only when absolutely necessary. In the event of removal of swollen glands for any reason, care is taken to make the scar as unobtrusive as possible, and the child should be kept very quiet for a day or two afterwards so that the scar is not disturbed. The dressings should be immediately changed when they are soiled by vomiting, urine or faeces.

Affections of the Veins.—A clot in a vein (thrombosis) may be caused by inflammation, the clot occurring because there has been injury or infection of some kind. A fibrinous plug may form, but a more serious condition is septic degeneration, after which fragments of the thrombus may pass into the circulation, causing septic embolism in the liver, lung or elsewhere, and even pyaemia. The modern treatment consists in the application of pressure to the affected vessel by means of pads and "Elastoplast" above the site of the thrombosis and allowing the patient to get up. Anticoagulants such as heparin and dicoumarin may also be given to prevent extension of the clot or the occurrence of embolism. Phlebitis is due to inflammation of the internal walls of the vein, and is associated with varicose veins, gout, constant pressure or toxæmia. The vein can be felt as a swollen, hot, thickened vessel under the skin, and the area it supplies may be waterlogged owing to oedema. Rest in bed, with frequent applications of soothing lotions such as *lotio plumbi cum opio* or glycerine, *ichthyol* and *belladonna*, together with elevation of the limb, may relieve the condition; the application of an "Elasto-

Excision of the Semilunar Cartilage.—The semilunar fibrocartilage of the knee may be wrenched loose by accident e.g. on the football field, and it may give trouble later by becoming caught between the femur and tibia and thus locking the joint and causing great pain. Many suffer from this for a long time, and have all the discomforts of sudden seizure, acute pain, swelling on the inner side of the knee and temporary fixation of the knee joint. Since reduction is but a temporary and unsatisfactory measure, the cartilage should be excised. This is done by making an incision over the medial aspect of the knee, exposing the cartilage and dissecting it out. Modern postoperative treatment includes the commencement of movement the day after operation; the patient gets up and is encouraged to walk on the 6th day. The patient continues exercises after discharge from hospital, nowadays at the hospital rehabilitation centre. Many sufferers feel more confident afterwards if they wear an elastic kneecap.

Acute Osteomyelitis.—Children between the ages of 3 and 12 may be affected with a very acute and serious inflammation of the epiphysis of the femur or tibia. Generally it is evidence of blood poisoning. The symptoms are very acute, like those of acute arthritis (already dealt with). At one time treatment consisted in drastic surgery followed by many months of severe illness, with pyrexia and delirium. The symptoms are very acute and are like acute arthritis at the onset; they are of long duration, often many months. They are quickly relieved however by sulphathiazole, penicillin or other antibiotics. Nowadays, as a result of operation to procure drainage of the infected bone followed by irrigation of the cavity by penicillin accompanied by penicillin given systemically also, the condition usually clears up in a few weeks.

Defects and Deformities

Defects and deformities may be congenital or acquired. The common conditions are discussed in the following paragraphs.

Congenital Dislocation of the Hip.—This may occur on one or on both sides and it may not be discovered until the child begins to walk. The earlier the treatment is given the better, as the child, if allowed to waddle about as he does, may so develop accommodative conditions that they prevent reduction. The treatment consists of giving the child an anaesthetic, and so placing the head of the femur in the shallow acetabulum that when subsequent immobilization of the femur in plaster in the abducted position is produced, the bone literally bores its own hole in the acetabulum. After 8 to 10 months, education in proper methods of walking begins.



Club Foot.—There are various forms. When the foot is dorsiflexed, we speak of *talipes calcaneus*; when plantar-flexed, *t. equinus*, as the foot is like that of the horse. Again the foot may be turned inwards (*t. varus*) or outwards (*t. valgus*) (Fig. 59). But the commonest form is a combination called *equino-varus*. If the condition be allowed to go on until the child grows up, the foot becomes set in the deformed position and special boots are neces-

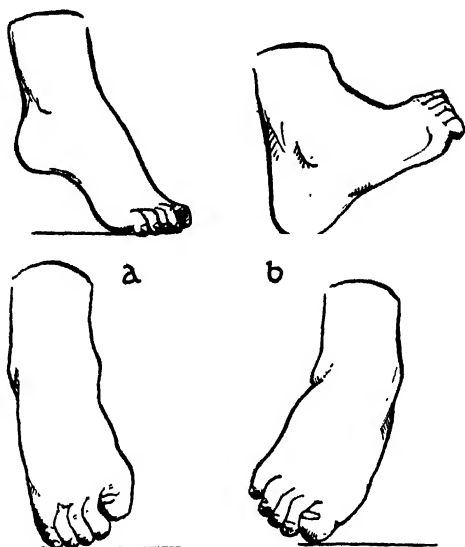


FIG. 59.—VARIOUS TYPES OF TALIPES.
a, *T. equinus*. *b*, *T. calcaneus*. *c*, *T. varus*.
d, *T. valgus*. Combinations of the above may be found.

sary, the patient walking on unnatural “soles” hardened by use. It is then impossible to reorganize the very abnormal structure of the foot. If a child be taken to the orthopaedic surgeon within a few weeks of birth, however, a course of treatment which lasts for years may then begin. The inversion is rectified by massage and passive movements carried out several times a day, after which an external splint is applied at the lower end and forcibly twisted until the foot appears normal, then the upper end is fixed firmly just below the knee. The plantar flexion is later overcome by cutting the *tendo Achillis* and adding to its length. During the night the child sleeps with a right-angled metal splint applied to the foot. Special shoes, built on this principle, are used when the child starts to walk, and wedges may have to be added to the

outside of the sole and heel of the ordinary footgear if the child should show any sign of the defect as he grows up.

Torticollis.—The sternomastoid muscle on one side may be contracted owing to strain during birth or to congenital deformity. The result is that the short muscle pulls the head to one side, so that the ear on the affected side is nearer the clavicle, while the chin points towards the sound side. Treatment may be conservative or radical. In the latter case the muscle is cut across, and the head and neck are enclosed in a plaster helmet which extends to the chest. When the position is stabilized, massage and movements are instituted.

Hallux Valgus.—In this condition the toe is pointed outwards and usually rests on the second toe. This exposes the metatarsophalangeal joint to much wear and tear, and a protective bunion usually grows. The operative treatment is that of excision of a part of the head of the metatarsal bone, removal of the bunion, straightening of the toe and application of a light plaster splint for 14 days. In some cases a rubber wedge is used to keep the toe straight; special boots may be made.

Hallux Rigidus.—This condition is a painful swelling of the metatarsophalangeal joint of the great toe, often resulting in growing boys from constriction of boots which are too short for them. Roomier footgear usually solves the problem. The front of the sole is often canted up by fixing across it a $\frac{1}{4}$ -inch bar of leather, thus throwing the weight of the foot on the heel. A wedge may also be applied along the inner rim of the sole and heel.

Hammer Toe.—This is a painful condition occurring in any of the toes and due to cramping of the feet. Generally the quickest way to comfort is amputation, or excision of the painful joint, thus counteracting the existing hyperextension of the metatarsophalangeal joint and the flexion of the first interphalangeal joint.

Flat Foot.—The arch of the foot may be too high (*pes cavus*) or it may be too shallow (*pes planus*), the latter state being one of flat foot. The arch may be lax owing to weakness, or definitely unstable owing to structural change. In either case the institution of daily exercises, the careful adaptation of a suitable boot by a sympathetic and intelligent bootmaker and the tight bandaging of the metatarsal arch and instep with "Elastoplast" for one week may help considerably. Growing children are best dealt with by approved exercises, by the application of a wedge to the inner side of the sole and by elimination of too much standing.

Spina Bifida.—When the spinal canal is not complete at birth and shows a marked rounded swelling, usually over the lumbar

region, the condition of *spina bifida* is present. This swelling, which is known as a meningocele, contains neural tissue and thus paralysis or spasm of the lower limbs is common. Otherwise the child may have various additional congenital defects, so that death is often a blessing. One in every ten live, however, and are invalids all their lives. Operations are very rarely successful.

Scoliosis

Scoliosis may be defined as a lateral bending of the spine, accompanied by rotation of the vertebral bodies to the side of the convexity of the curve. It may be congenital or acquired. Conditions allied to scoliosis are lordosis and kyphosis. Lordosis is exaggeration of the dorsal curve, kyphosis may be an exaggeration of the dorsal curve or more rarely kyphosis may occur in the lumbar region, when the convexity will be backward instead of forward. (See also Chapter 9.)

Causes.—*Congenital.*—This may be the result of deformities such as hemivertebrae, fusion of ribs, inequality of the number of ribs on each side, weak musculature affecting the longitudinal muscles of one side only, congenital torticollis, unilateral short leg or unilateral kidney.

Acquired.—Scoliosis may occur as a result of infections and inflammations as poliomyelitis, pleurisy, empyema or Pott's disease (see Chapter 9). There may also be metabolic causes such as rickets and infective arthritis. Thirdly, there is a traumatic group including fracture of ribs improperly treated or crush fracture of one of the vertebral bodies. Lastly, scoliosis may have a neoplastic origin.

Scoliosis may also be the result of habit posture, especially in school-children, of incorrect standing or sitting or of spastic paralysis. It may be postural when the position can be corrected, or structural when bony structures are affected.

Treatment.—It is very important to teach the correct balance of the whole body and to use the muscle groups in such a way as

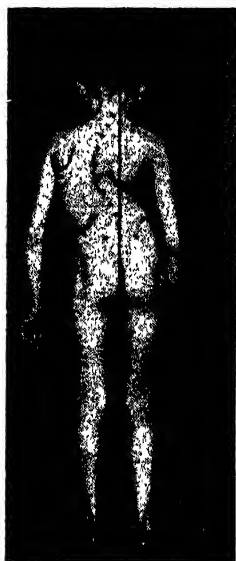


FIG. 60. — SCOLIOSIS DUE TO POLIOMYELITIS WHERE THE SUPPORT HAS BEEN INADEQUATE. (With acknowledgments to the Physiotherapy Department, the Hospital for Sick Children, Great Ormond Street, London.)

to exert the maximum effect upon thorax, spine and pelvis. Exercises which move the arms and legs only are not sufficient, but should be included. The work is highly specialized and should be undertaken by a trained remedial gymnast only, although some simple home exercises are always given in addition to those done under supervision at the hospital. These home exercises are carefully taught and supervised from time to time.

Aims of Treatment.—1. To mobilize and strengthen the spine. In practice the two things should be simultaneous, for if a child is walking, to mobilize a back beyond its muscular strength is dangerous. 2. To teach correct posture, re-educate postural sense and strengthen muscle groups for the maintenance of cor-



FIG. 61.—KLAPP'S CRAWL FOR CORRECTION OF SCOLIOSIS.

(With acknowledgments to the Physiotherapy Department, the Hospital for Sick Children, Great Ormond Street, London, and Pictorial Press.)

rected posture. 3. To correct the curve, stretch the concavity and contract the convexity.

In severe cases the spine is rigid and there may be gross deformity of spine, chest and pelvis, resulting in poor thoracic excursion, digestive disturbances due to displacements and compression and aching muscles and referred nerve pains.

A course of treatment from time to time may help to tide patients over difficult periods. By liftings, stretchings and attention to neglected abdominal and trunk muscles the superimposed fatigue droop is overcome, circulation becomes freer, and digestion and elimination are aided. The only really satisfactory

treatment belongs to the early stages; it cannot be too often emphasized that a baby is not too young to be treated after he is 6 weeks old. In addition the muscles may be stimulated electrically and various corrective plasters, corsets and jackets may be needed in severe cases. It should be remembered that tuberculous spines should never be mobilized.

Prognosis.—Postural scoliosis can be cured and a mild degree of structural curvature can be greatly improved. When

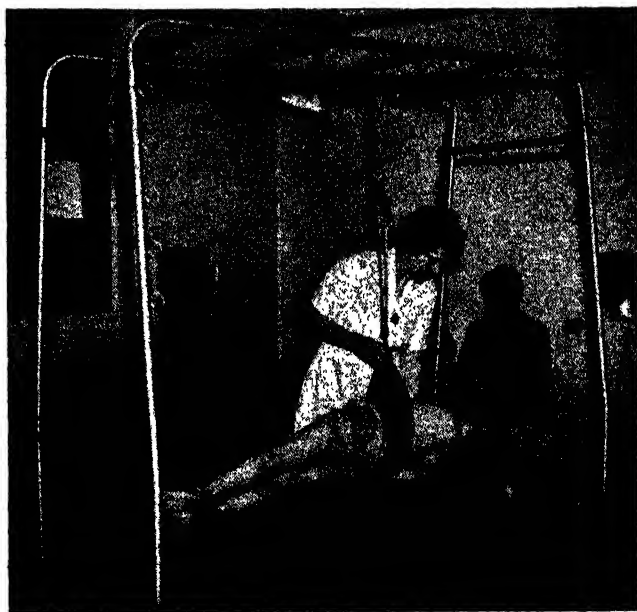


FIG. 62.—CORRECTION IN SLINGS FOR SCOLIOSIS.

(With acknowledgments to the Physiotherapy Department, the Hospital for Sick Children, Great Ormond Street, London, and Pictorial Press.)

the condition is severe, with perhaps a triple curve, many orthopaedic surgeons use the Steindler method which allows the primary curve to remain rigid and which mobilizes the spine above and below that region and encourages the formation of compensatory curves above and below the primary one in an opposite direction in order to balance the whole and to aim at good posture. If the structural changes are not too severe a fair result may be obtained and the deformity not unduly apparent when the patient is dressed. Postural lordosis and kyphosis can also be cured.

Operations

Amputation.—If a limb is to be amputated, the skin must be prepared in the usual way and special provision must be made in the theatre for the disposal of the limb. The patient is put into a special bed (see Vol. II, p. 306), the stump protected by a bed cradle and immobilized between sandbags and a towel. The nurse should be on the look-out for bleeding, and shock may require the usual remedies. When the stump has properly shrunk, an artificial limb should be fitted. Delay in healing may be due to sepsis, to a dead fragment of bone or to a cone-shaped stump resulting from retraction of the tissues which leave a protruding fragment.

Arthroplasty and Arthrodesis.—These terms refer respectively to the operations which are devised to move or to immobilize a joint. In some cases the joint can be excised by removing the head of the bone and two methods of after-treatment are adopted, depending upon the needs of the case. When a joint of the arm is removed, we want to make mobility possible, therefore the limb is made to move as early as convenient. In the leg, stability and movement are the chief needs, therefore prolonged treatment is indicated. The most modern treatment, however, is reconstruction of the hip joint by the removal of the head of the femur and replacement by an acrylic prosthesis of the same size. The head has a constricted stem which fits into the medullary canal of the neck of the femur. Results so far have been very satisfactory.

Laminectomy.—In addition to Hibbs and Albee's operations on the spine (see p. 121) there may be need to divide the pillars of the spinal arches so that the spinal cord is freed from pressure; the operation is sometimes performed after a fracture. Laminectomy may be done on one or two vertebrae, the patient lying on "pillars" made by sandbags placed under the forehead, upper part of thorax and pelvis. A complete plaster casing in two halves is set ready; the patient is lifted into one and the other is fixed over him. Arrangements must be made for bladder and bowel evacuation, for prevention of bedsores, and for the easy movement of the patient. Frequent dressing is usually necessary. (See also Vol. III, Sec. VII, Chapter 1, and p. 121 of this volume.)

Tenotomy.—A tendon may be divided subcutaneously by a tenotome (Fig. 63). Tenotomy may be called for in any of the deformities described above. Tendons may be shortened, lengthened or transplanted according to the needs of the situation. Silkworm gut or chromic catgut are the materials used for the sutures.

Cranlectomy.—In this operation a flap is turned back on the scalp, the bone is exposed, a small hole is made by a trephine and the edges are nibbled away by bone forceps or other means until a satisfactory opening is produced. After the operation, which is usually undertaken for fractures with depression, for internal abscesses, or haematomata, for the relief of fluid pressure,

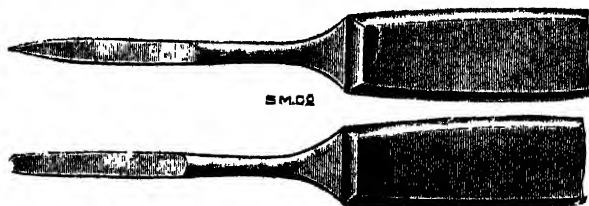


FIG. 63.—TENOTOMY KNIVES.

The first is sharp-pointed; the second is blunt.

(By courtesy of the Surgical Manufacturing Co., Ltd., London.)

or for excision of a tumour, the opening is covered by the skin flap. In some cases, the bone is preserved by turning it back with the scalp. Very careful preparations must be made, the scalp being shaved all over. The after-treatment is characterized by quietude and darkness; nasal feeding is necessary. Owing to the critical nature of the complaint, numerous complications associated with cerebral irritability are to be expected—restlessness, delirium, interference with heart and lung rhythm, vomiting, incontinence and trophic sores. These must be dealt with by the nurse as they arise.

CHAPTER 7

NEOPLASMS, BENIGN AND MALIGNANT

NEOPLASMS. BENIGN TUMOURS. MALIGNANT TUMOURS.
TREATMENT OF NEOPLASMS. CYSTS. SOME COMMON
NEOPLASMS. CANCER OF THE TONGUE. CANCER OF THE
OESOPHAGUS. CANCER OF THE STOMACH. CANCER OF THE
BREAST. CANCER OF THE RECTUM.

A **NEOPLASM**, or new growth, is an arrangement of cells formed in the living tissues and containing various constituents akin to those of the tissues, but yet performing, so far as can be made out, no useful function. All neoplasms tend to progress at the expense of, or to the detriment of, the surrounding tissues, and sometimes at the expense of the whole system. The cause is not fully understood. We cannot call an abscess a neoplasm, nor can we apply the term to a contusion, because in both these cases there is a reparative and protective function which is temporary; inflamed glands belong to the same category.

The word, **tumour**, is universally applied to neoplasms, because at first it was thought that all new growths produced a swelling. Many do this of course, but certain neoplasms begin as small excrescences which ultimately form eroding ulcers; properly speaking the latter are not tumours.

While the actual cause is unknown, contributory factors are known to be those of hereditary predisposition, infection, irritation for a long period by certain substances and injury. The two great classes are:

1. The benign, simple or innocent tumours.
2. The malignant tumours.

Benign Tumours.—The outstanding characteristic of benign tumours is that they do not replace the tissues among which they grow; they can certainly cause atrophy by pressure, but they are self-contained, do not infiltrate the surrounding structures, and do not disseminate. Usually a simple tumour has a limiting capsule and is formed of an aggregation of a certain type of cell (e.g. fat, fibrous tissue or nerve tissue) the growth taking place by internal proliferation. The neighbouring lymphatic glands do not become infected and there is no tendency to recurrence after the tumour has been removed. A single tumour of benign type

may be found, or there may be multiple tumours of similar character in a region. The only real danger of these neoplasms is that associated with their pressure on great vessels, nerves or other important structures. Nurses should fix in their minds that, as a general rule, the simple tumour looks far worse than it really is; the sight of a great lipoma (fatty tumour) or of a massive fibromatous growth of the uterus may be alarming, but it is nothing in importance to the small wart that may appear on the lip, or the slowly-growing hard tumour that invades the pyloric end of the stomach and ultimately involves the neighbouring tissues with malignant nests.

The subclassification of tumours is made on the embryonic tissues from which they arise, and most belong either to the connective tissue group or to the epithelial group, but such distinctions need not concern the nurse. She must learn to regard neoplasms as named because of the predominance of a certain element in their structure, and the question of innocence or malignancy must be determined by study and experience. The main benign tumours are summarized below.

1. *Angioma*: Chiefly composed of blood vessels. A common example is the naevus.

2. *Chondroma*: Cartilaginous tumour, generally occurring in young persons.

3. *Fibroma*: Fibrous tissue predominates; forms warts on the skin and other tissues.

4. *Lipoma*: A tumour which may occur singly or in groups; it may reach a great size and appear as a rounded, egg-like swelling below the skin. It may be mixed with other tissues such as fibrous tissue.

5. *Lymphangioma*: Composed of lymphoid tissue.

6. *Myoma*: A tumour made up of unstriped muscle. The fibromyoma, or fibroid, is common in the uterus, and consists of fibrous and muscular tissue.

7. *Myxoma*: Chiefly mucoid tissue.

8. *Neuroma*: Nerve tissues are rarely found unassociated with fibrous tissue; neurofibromata are common. Some neuromata are malignant. A neuroma is a term applied to any growth occurring on the sheath of a nerve.

9. *Odontoma*: This is a peculiar type, based on the primary cells of the teeth; it forms large tumours of the jaw.

10. *Osteoma*: A bony tumour; it usually forms irregular outgrowths from the bone.

11. *Adenoma*: While this tumour has the essential elements of a gland, it cannot produce secretion, and has therefore no function. Cysts may form.

12. *Papilloma*: This is represented by warts, corns and similar growths and by various outgrowths from mucous membranes e.g. in the bladder or rectum. It has a fibrous root or centre, which does not penetrate deeply, and it is usually covered by epithelium. In appearance it is like a miniature piece of seaweed. It has a tendency to become malignant when it grows from mucous surfaces.

Malignant Tumours.—In contradistinction to benign tumours, the malignant neoplasms recur after removal, form metastatic or disseminated new centres in neighbouring or distant organs, involve nearby lymphatic glands, infiltrate their own ground and in the course of time cause death. All malignant tumours originate in a minute papule or smaller centre.

The dangers of these neoplasms are obvious. It is impossible to say whether they are completely removed by operation, which is always difficult owing to the infiltration of the tissues. No matter how careful a surgeon may be, he cannot know whether there is a dormant or new cell nest in an adjacent organ likely to flare up and form secondary growths with great rapidity. Local recurrence is also possible when a single malignant cell is left. There is permanent destruction of the culture bed of tissue on which the malignant growth is raised. Various virus and bacterial theories have been advanced and discredited. Undoubtedly cancer produces a form of toxæmia which reduces the patient to a state of cachexia, or extreme emaciation, but the experts can explain that this toxic state is the result of the pressure of the growth, or hæmorrhage due to erosion, or lack of vital essences, owing to strangled glands, or septic poisoning, or other abnormal conditions brought about by actual destruction of normal and vital cells of supreme moment to the general metabolism of the body, and by replacement of them by proliferating cells which are like parasites in their action. The various theories of the spread of cancer are based on some unexplained loss of the normal tension of the tissues or on an indefinite deviation from the normal equilibrium of the body cells. The following are the chief malignant neoplasms.

1. *Sarcoma*.—Derived from the connective tissue; this is a disease of the young. As in all malignant growths the malignancy is variable, there being all stages from mild malignancy with slow growth to intense malignancy with rapid growth. A sarcoma consists of a stroma of fibroid tissue, this supporting collections of round or spindle-shaped cells. Bone and cartilage are chiefly involved and the spread is usually rapid and by the blood stream. All these tumours are well supplied with blood in primitive vessels. Sarcoma may also be found in the lungs, lymphatic glands, tonsils and testes. Many such tumours have origin in the pigment cells and are coloured with brown pigment (melanin).

Moles may therefore be danger points in the skin. The treatment is that of urgent and complete excision, with sacrifice of much of the apparently innocent neighbouring tissues.

2. *Carcinoma*.—This is the type which is generally regarded as cancer, and it is the most dangerous of all as it seems to have set the human being an impossible task in the overcoming of the evil. All carcinomata are derived from the epithelium. They are divided into the epitheliomata proper, arising from the squamous cells of the surface of skin or mucous membrane; the rodent ulcers, which begin in the malpighian layer of the skin; the columnar-celled carcinomata; and the round-celled or spheroidal carcinomata.

Cancer is a disease of the middle-aged and the old. It appears that once the epithelial cells become established in the tissues to which they are foreign, they proliferate with amazing rapidity and they soon involve many of the neighbouring tissues, choosing the lymphatics as their highways. Thus a simple little malignant ulcer of the lip may involve the glands and the connective tissue of the neck in a mass of cancerous tissue; the hard cancer of the breast (scirrhus) soon spreads not only to the connective tissue and muscles below it, but also to the axillary glands and bones. There is no boundary to cancer; every centre radiates its malignant influences. Advanced cancer by pressure may erode the skin and may present itself as a fungating sore, thus ending the patient's life by giving rise to fatal haemorrhage. Cancerous particles may travel by the blood stream to distant parts and there establish secondary centres.

Treatment of Neoplasms.—Individual examples are given later, but for the present we must make a study of the main principles of treatment in general.

Benign Tumours.—A benign tumour may be removed when it is painful or causing pressure symptoms, but chiefly because it is unsightly and has the slur cast upon it by laymen who look on all tumours as "cancer." When the growth has been removed completely and examined and reported upon by the pathologist, the patient is relieved of all his anxieties. The operations are usually very simple and nearly always successful. The only urgency about benign tumour removal is when there is a danger of malignant degeneration. Certain borderline tumours require to be carefully excised, and the patient may be required to submit to observation for a year or two.

Malignant Neoplasms.—There are several ways of dealing with cancer. First there is the time-honoured method of removal of the epithelioma or other growth by free excision, combined with careful dissection and removal of the surrounding parts, especially the glands. The most hopeful outlook is that which is based on the fact that the condition has been recognized early and opera-

tion performed before the disease has spread far. But who can say how far the cells have already travelled? Sarcoma requires to have radical treatment also.

The most modern forms of treatment are those of x-rays and radium which can be used as the methods of choice in some skin cancers, and for certain other deep-seated or inoperable growths; they are also used in conjunction with surgical measures, e.g. amputation of breast. X-rays may be applied superficially or deeply and in carefully calculated doses at intervals. Radium may be used by laying on lead-covered plaques, by platinum needles, by "bombs" containing large amounts of radium, or by gold seeds containing radon, a radioactive gas obtained by suspending radium in hydrochloric acid. Rodent ulcer reacts well to x-rays and to implantation of gold seeds, which lose their radioactive property after about 7 days. Diathermy is useful in some cases. The conquest of malignant neoplasms, however, is still far off; much work will have to be done before a rational treatment is possible. At present we are progressing slowly and with a certain amount of sureness, but no one can justly claim that there is any cure.

Cysts

A cyst may form in various situations; it is a pre-existing cavity which has become dilated by fluid or by soft matter. The following are the chief varieties.

1. *Dermoid Cysts*.—These are lined by skin or mucous membrane and contain structures such as hair, nails, teeth, sebum or mucus. They may take the form of sequestration cysts and are found at the points at which, in the embryo, the various joints have occurred between skin and skin or membrane and membrane. Thus we may find them anywhere in the middle line, at the edges of the orbits, in the neck, and so on. They appear as small globular, resilient swellings, over which the skin can be freely moved. Sequestration cysts rarely contain anything but sebum. They may also appear as implantation cysts, caused by the driving of a small island of skin deeply into the tissues by accidental injury. They may be found in the eye or on the hands. A cyst may also have origin in an embryonic canal. The commonest dermoid is probably that found in the ovary. In this case the contents are simple embryonic structures, the whole resembling a piece of work that has been begun and hastily abandoned. Hair, skin and teeth are to be found and usually sebum, but other structures such as rudimentary mammary glands have also been discovered.

2. *Duct and Tube Cysts*.—When there is any obstruction to the outlet of a gland, the whole gland becomes distended; the con-

dition is described as a retention cyst. We find these in the pancreas, the mammary glands, and the kidneys, and commonly in the sebaceous glands of the skin, where the well-known sebaceous cyst or wen occurs. Certain embryonic ducts may enlarge and form cysts, these being found in the reproductive areas. Various cysts may also be formed by synovial membranes and tendon sheaths or by pockets of the peritoneum; thus we have synovitis and bursitis, the latter giving rise to prepatellar bursitis, or "housemaid's knee," and to ganglia in the neighbourhood of tendons; hydroceles are formed from the peritoneum.

3. *New Cysts*.—We have already learned that a large blood effusion may form a cyst containing fluid. Parasites may also form cysts, usually multiple, the commonest being the hydatid cyst, occurring in the liver. When a benign neoplasm degenerates, it may disintegrate in its interior and thus form a cystic tumour.

Some Common Neoplasms

Neoplasms choose certain favourite sites; thus both simple and malignant tumours give rise to well-known conditions which are seen frequently in the wards of hospitals. The following are brief outlines of the main diseases.

Cancer of the Tongue.—In addition to the various ulcers of the tongue already mentioned in Vol. III, Section IX, Chapter 4, epithelioma of the tongue is a fairly common disease. The theory has been advanced that it is the result of the constant irritation of tobacco, or the stem of a hard pipe or the jagged edge of a tooth, but nothing is definitely established. It affects middle-aged men, and may begin just under the edges, opposite the molars or a little farther back. A very foul ulcer forms and soon the whole structure of the tongue is involved in adhesions while the lymphatic glands of the neck become hard and irregular.

Treatment.—The operation of amputation of the tongue is now rarely performed for this condition. Irradiation by implantation of radium needles into the tongue, and the application of radium "moulds" or cages carrying radium tubes placed on the neck like a collar, used to irradiate the affected neck glands is the usual line of treatment. Alternatively, the operation of block dissection of the glands of the neck may be performed, once the growth has been satisfactorily treated by irradiation. Previous to the treatment, the nurse may do her best to remove all sources of infection from bad teeth, septic tonsils, chronic nasal catarrh and other foci, by mouth washing and douching, and she may carefully sterilize the skin of the face by close shaving and regular antiseptic treatment.

So far as routine treatment is concerned, the patient should be

nursed in the semi-recumbent position, and he may require to have constant irrigation of the mouth; he usually makes an attempt to talk, and this does not help matters. Feeding is best accomplished by passing a nasal tube, or by pouring in fluids from a feeding cup with a long rubber spout. A watch must be kept to prevent choking. This may result from laryngeal oedema. Irrigation of the mouth is best carried out by use of a "hygenator." The silk cords attached to the radium needles are strapped to the patient's check, but must be unstrapped, counted and checked every time the nurses in charge of these patients change duties.

Cancer of the Oesophagus.—A history is usually given of dysphagia (difficulty in swallowing) with progressive wasting, pain in the throat and constant vomiting or rejection of food immediately after it has been swallowed. The condition may be likened to the gradual tightening of a ligature round the oesophagus until the passage is occluded. The surgeon may examine the condition in 2 ways, the first by passing bougies, which eventually become stuck and the second by watching the act of swallowing when the patient is being examined by x-rays.

Treatment.—If the patient is first seen when the growth is operable, the treatment of choice is oesophagectomy, i.e. removal of the affected portion of the oesophagus through an incision in the right side of the chest and removal of a rib, after the freeing of the stomach from the greater omentum by an abdominal incision. The stomach and proximal end of the oesophagus are then anastomosed, and the post-operative nursing is on similar lines to that of the radical stomach operations.

The alternatives are deep x-ray therapy or intubation with Souttar's tube, and in very advanced cases, gastrostomy, in order that the patient may receive nourishment through a catheter which is tied into the stomach at the time of operation.

Adequate diet and fluids must be given by this means, at regular intervals, and the patient is allowed to wash out the mouth with tea or other tasty fluids and to chew fruits; but not to swallow them, in order that he is not entirely deprived of the privilege of tasting food. Strict attention to oral hygiene is essential whichever form of treatment is chosen.

Cancer of the Stomach.—The pylorus is commonly affected, and there is obstruction to the passage of food, with pain, vomiting and general cachexia. Very often the stomach cavity is greatly enlarged and the food accumulates until it is perforce rejected every other day in an enormous and most offensive vomit of sour, partially digested matter.

Treatment consists in a preparatory washing-out of the stomach for a few days. If the surgeon cannot take away the pyloric growth he may do a gastroenterostomy and thus by-pass the

pylorus, but this does not stop the cancerous process, which in the advanced stages also invades the liver, studding it with hard nodules. Sometimes the operation of complete or partial gastrectomy may be done. In the former case the cardiac end is stitched to the jejunum; in the latter pylorotomy only is performed. Careful feeding with prepared fluids is the rule for days afterwards, the ration being supplemented when the new passage is functioning properly, usually one week after operation.

Cancer of the Breast.—Apart from inflammation of the breast (mastitis), which in the acute stage may form an abscess, and in the chronic stage give trouble owing to diffuse swelling and pain, the condition of scirrhus cancer of the breast is the commonest disease of the mammary gland. It affects women usually at the age of 40 to 45 and may progress slowly for years. The axillary glands are often affected and they cause great discomfort, pain and engorgement of the affected arm.

The condition starts as a small hard nodule usually on the outer and lower quadrant of the breast. There is little pain at first, but as the cancer develops an irregular swelling may grow as large as a hen's egg, and the smoothness of the skin is puckered by adhesions which give a typical "orange-skin" appearance; the growth may also be adherent to the pectoral muscles. Hard nodules are felt in the axilla.

Treatment.—If left, the scirrhus may ulcerate through, and as women are always reluctant to consult a doctor about these things, this accident sometimes happens with most difficult after-effects. In the event of early diagnosis however, the whole breast, with the axillary glands, may be taken away. The diathermy knife has proved useful in such cases. The surgeon makes the most punctilious investigation of the area and tries to leave no possible channel of transmission behind. The axilla is drained by a rubber drainage tube of fairly large bore which is usually removed 48 hours after operation. The arm must be kept abducted for some days and the forearm should be supported by a pillow; in some cases a sling is used to take the strain off the whole limb. Generally there are no immediate complications beyond oozing from the wound, and the stitches may be removed within a fortnight. There is usually some stiffness of the arm and this should be carefully reduced by massage and exercises. Massage may have to be continued for a long time in order to induce efficient drainage from the affected arm, which often remains congested. Radium and x-ray treatment may also be used if the operative measures are not possible, but it must be emphasized that x-ray therapy, in conjunction with radical amputation, is now largely practised. It may be said, however, that if breast cancer be taken in good time there is a chance of prolongation of life, provided that the original disease has been

well eradicated and the axillary glands completely cleared. The function of the arm is one of the chief considerations and may require much attention, but the wound rarely sloughs or breaks down.

Cancer of the Rectum.—Cancer of the rectum in the advanced stages is treated by colostomy, already described. The condition produced is not unlike that of cancer of the oesophagus, the alimentary tube gradually becoming narrowed by the hard growth. In time ulceration and bleeding may take place. To

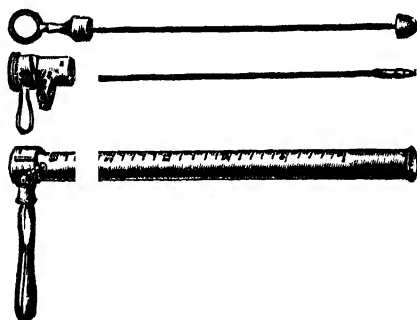


FIG. 64.—STRAUSS'S SIGMOIDOSCOPE.
(By courtesy of the Surgical Manufacturing Co., Ltd., London.)

begin with the symptoms are those associated with the condition—constipation for a period, then an era of diarrhoea, pain of a heavy dull character in the lower part of the pelvis, passage of blood-stained mucus and gradual loss of weight and vigour. In nearly every case the condition is diagnosed before the obstruction is complete, this giving time to prepare the patient for the

colostomy. The treatment consists of excision of the rectum when the condition is discovered early, or implantation of radium; but some patients come too late to the surgeon and therefore we can only temporize by giving sloppy foods containing as little cellulose as possible, by evacuating the narrowed bowel by means of lubricating enemas, by lavage of the lower bowel and by performing the operation of colostomy.

As a rule, the rectum and anus are removed, and the patient left with a permanent colostomy, and as these structures normally contain large numbers of organisms which are pathogenic outside the bowel, nurses should take great pains to ensure that the preparatory treatment is thorough. The lower bowel is usually cleared out, on the day previous to the operation, by a brisk purge. The minimum of food is given on this day. Next morning a large soapy enema is given so that the rectum is completely cleared. Two hours before the patient is taken to the theatre he should have a final irrigating enema of saline. The usual pre-operative dressings should be applied. After the rectum has been excised there is considerable shock and nearly always some bleeding, the clot forming inside and producing all the symptoms associated with internal abdominal haemorrhage. Urinary difficulties are the rule; the usual method of treatment

being the insertion *per urethram*, of a self-retaining catheter for female patients, and a gum elastic one for men.

Shock must be adequately treated in the early postoperative stages, by the usual methods, fluids being given intravenously, and chest complications are the next consideration, as the patient has to lie almost flat for the first few days, either on the back or on the side.

Light diet may be taken the day following operation and quickly built up to a nourishing high-protein diet to assist healing.

A large pack is left in the wound following operation, which is removed in 48 to 60 hours, and thereafter the wound is irrigated with antiseptic lotions and repacked once or twice daily.

With proper care and the use of antibiotics, the wound will heal in 4 to 6 weeks, whereas in the days which preceded chemotherapy, patients in some instances still had a discharging sinus 6 months, and even longer, after this operation.

CHAPTER 8

THORACIC SURGERY

EMPHYEMA OF THORAX. BRONCHIECTASIS. PULMONARY TUBERCULOSIS. THORACOPLASTY. LUNG ABSCESS. SURGICAL DRAINAGE. MALIGNANT DISEASE OF THE LUNG. PNEUMONECTOMY. INJURIES OF THE THORAX. FRACTURED RIBS. SURGICAL TREATMENT OF ABNORMALITIES AND DISEASES OF THE HEART AND LARGE VESSELS. CONGENITAL ABNORMALITIES. PULMONARY EMBOLISM. ISCHAEMIC HEART DISEASE. SUPPURATIVE PERICARDITIS. CONSTRICTIVE PERICARDITIS (CAPTIVE HEART).

Empyema of Thorax

EVENTS leading to empyema, and the signs and symptoms of this condition, have been described in Vol. III. The condition commonly occurs as a complication of pneumonia, but other causes include cancer, lung abscess, subphrenic abscess, tuberculosis and intra-thoracic injury. The organism responsible may be the pneumococcus, streptococcus, tubercle bacillus, staphylococcus, the colon bacillus or actinomyces; the first two are the most important.

After the surgeon has decided, by physical and x-ray examination and by a test withdrawal of fluid from the pleura, that pus is present, his plan of campaign depends upon the results of the treatment described below. It is important that the nurse has a picture of well-established empyema as one of a collapsed lung surrounded by a bag containing fluctuating pus, with the walls thickened and inflamed, and covered on the internal aspect by a variable layer of thick lymph which later becomes the site of granulations, cicatricial tissue and all the constituents of the abscess cavity already described elsewhere in this work. The lung itself is the site of the fibrosis. It is obvious that unless the fibro-cicatricial tissue is stopped in its progress, permanent fibrous bands will moor down the lung and render it useless for the future.

As a general rule, therefore, an attempt must be made early to clear out the pus and allow the lung to expand and occupy its usual space in the thorax.

The first method of treatment for all cases of empyema is the daily aspiration of pus from the cavity which is then injected with 500,000 to 1,000,000 units of penicillin; penicillin is also given systemically.

The majority of patients recover with this treatment and skilled nursing care, but in one or two cases the condition does not clear up, and in some fibrin clots tend to form and block the aspirating needle.

For these patients the treatment is open drainage with resection of rib.

An incision about 3 inches long is made over the selected rib: the periosteum is stripped off and about 2 inches are resected. The abscess cavity is cleared out by suction, and a large rubber drain is inserted, the Holmes Sellors empyema tube (Fig. 65) being frequently used these days, as it permits freer drainage than most patterns.

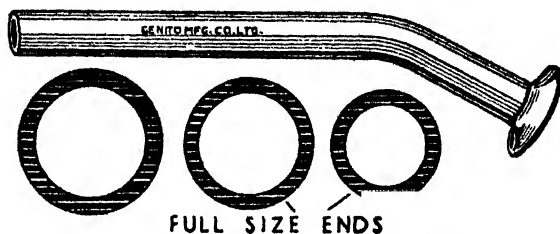


FIG. 65.—HOLMES SELLORS EMPYEMA TUBE.
(By courtesy of The Gento-Urinary Mfg. Co., Ltd., London.)

This tube is connected to a water-seal bottle for 4 or 5 days, after which it is allowed to drain into the dressing. In about 10 days a smaller tube is inserted in place of the large one, and is removed only when the abscess cavity is no longer present, which state is determined by injecting Lipiodol into the tube and x-raying the chest.

Antibiotics are administered systemically throughout treatment, and the empyema cavity may be irrigated with saline and penicillin daily, when the dressing is renewed, though this treatment is definitely contraindicated in the presence of bronchial fistula, which manifests itself by audible suction with each inspiration.

In children, in whom the ribs are very pliable, intercostal drainage may be established by inserting a catheter between the ribs following the administration of a light general anaesthetic.

When the closed drainage method, i.e. with the water-seal bottle, is used the nursing care is very important, for though it is easy to ascertain that it is working effectively by glancing at the glass tube leading under the water in the Wolff's bottle,

when it will be seen that the water in the tube rises about 2 inches with each inspiration and falls back to the level of the main mass of water with expiration; but on no account must the Wolff's bottle be raised level with the patient unless the drainage tube has been previously clamped securely. Failure to observe this precaution will lead to aspiration of water from the bottle into the pleural space.

The amount of water in the bottle is of a given quantity, and to measure the drainage from the pleural cavity the drainage tube is clamped and the bottle emptied at a fixed time, twice daily.

The total quantity of fluid is measured, the amount of water subtracted, and the result written up on a special chart kept for that purpose, as the 12 or 24 hour drainage from the empyema cavity.

The bottle is replaced by a new sterilized bottle containing the same amount of water, whilst the one recently emptied is disinfected, cleaned and re-sterilized in readiness for the next replacement.

General treatment consists of skilled nursing until the patient's condition will allow him to resume gradually his former independence.

Nourishing fluids and light diet in the early stages should be reinforced by proteins as soon as possible while vitamins are necessary throughout, preferably in their natural form rather than in tablets.

Fowler's position facilitates drainage and the patient's respirations, and an air cushion alleviates the discomfort produced by the prolonged assumption of this position.

The day following operation the nurse should provide the patient with two Wolff's bottles, connected to each other by rubber tubing, one of which contains water, and from which a piece of tubing with a mouthpiece reaches to the patient, who is encouraged to blow the water from one bottle to the other, and then to suck it back again; coloured water is used for children.

Physiotherapy also plays an important part in the patient's recovery and rehabilitation. This includes breathing exercises and exercises to prevent scoliosis and to mobilize the arm on the affected side, which the patient tends to rest completely.

The patient is allowed up about the 10th day if progress is favourable, with the drainage tube closed by a clip or spigot if still *in situ*, and may be discharged between the 4th and 6th weeks, after which a prolonged convalescence is required, some of which should be spent by the seaside, if possible, followed by a course of rehabilitation before work is resumed.

Delay in healing is occasionally a troublesome feature where empyema is concerned, and may be due to the following causes:

1. The tube may be sucked into the empyema cavity as the

patient breathes in. This calls for great care on the part of the nursing staff, who must always see that the tube is securely strapped to the chest wall, and make a point of precision in reports upon the removal or changing of such tubes.

2. The drainage may be inadequate, or the tube not in the correct position.

3. The presence of other diseases, e.g. carcinoma, tuberculosis, actinomycosis.

4. Bronchial fistula.

Bronchiectasis

The nature of this disease is described in the medical section, Vol. III, and it must be borne in mind that the patient's general health is poor in consequence of the prolonged infection of the dilated bronchioles, and that he is susceptible to attacks of localized pneumonia of the lung tissue adjacent to these pus sacs, therefore exposure to damp and cold, and contact with persons suffering from colds, must be avoided.

Where the condition is confined to one lobe, the operation of lobectomy is sometimes performed: that is, removal of the entire affected lobe, then the pleural space is drained as in the surgical drainage of empyema, with closed drainage.

In order to ensure that the patient is as fit as he possibly can be for this operation, he is given a special course of treatment lasting 1 or 2 months, consisting of exercises, such as running and games, to increase the vitality, selected exercises to strengthen the respiratory muscles and increase the vital capacity of the lung, fresh air and sunlight, nourishing diet, vitamins, antibiotics, expectorants and postural drainage.

The blood is grouped and cross-matched, and transfusion is usually commenced immediately after the anaesthetic is given, before the surgeon makes his incision.

As in empyema, it is important in the postoperative stage to encourage expansion of the lung, as this is the means by which the cavity left by removal of one of its lobes is closed.

Blood which enters the closed drainage bottle is carefully observed and measured, and, if it is excessive, the fact must be reported at once. The nursing care closely resembles that given in the surgical treatment of empyema; but a steam tent may prove useful for the first 2 or 3 days, as this greatly facilitates expectoration.

Expectorants may also be given and antibiotics are continued, as is physiotherapy. The tube draining the pleura is removed about the 10th day, according to the surgeon's wishes, and the patient may be allowed up at the end of a week, and discharged about a month after operation.

Rehabilitation exercises are commenced soon after the patient gets up and continued after his discharge. A prolonged convalescence is needed, and the patient's resumption of work should be preceded, where possible, by a period in a rehabilitation workroom.

Pulmonary Tuberculosis

Surgery has been used increasingly during the last few years in the treatment of suitable cases of pulmonary tuberculosis, commencing with operations on the phrenic nerve and extending to major undertakings such as thoracoplasty, lobectomy and segmental resection of the lung.

Thoracoplasty.—This operation, which once carried a high mortality rate, is performed on patients who have unilateral cavitation which has failed to respond to the less radical treatments such as artificial pneumothorax, streptomycin and P.A.S., "Isoniazid" and other forms of treatment used in conjunction the usual sanatorium regime.

Preparation of the operation site commences a week before operation with the usual skin-cleansing routine and application of antiseptic compresses, and preparations, as previously described, are made for blood transfusion which is commenced before or during the operation which is carried out in one, two or three stages.

Any number of ribs may be partially removed, each rib being divided about 2 inches from the sternum anteriorly, and the vertebral column posteriorly, after being stripped of their periosteum, but usually the upper four ribs are removed in the first stage, and the next four a fortnight later. In some instances only a small selective collapse is effected.

General anaesthesia is used in conjunction with a dose of curare sufficient to paralyse the respiratory muscles, the anaesthetist effecting artificial respiration by the rebreathing bag of the closed-circuit anaesthetic machine throughout the operation.

At the conclusion of the operation, that part of the chest wall from which the ribs have been removed is tightly compressed by pads of sterile wool supported by a many-tailed bandage, in order to ensure that the underlying lung is collapsed and to prevent the occurrence of paradoxical breathing, in which contraction of the chest wall on the unaffected side inflates the unsupported lung as in inspiration, while expansion produces the effect of expiration in the diseased lung. Later on, satisfactory collapse is ensured by the daily application of weights to the affected side during rest hours.

The patient is nursed on the unaffected side with the foot of the bed elevated for a few hours following operation, in order to

facilitate drainage from the newly-collapsed cavity, and the patient is encouraged to cough as soon as consciousness is regained, and thereafter frequently, as it must be remembered that the material drained probably contains millions of tubercle bacilli, and if allowed to remain in the bronchus, it may be aspirated into the healthy lung, thus setting up a fresh tuberculous focus, or causing collapse of one or more of its lobes. Blood transfusion is stopped when the patient's condition permits, Fowler's position is assumed, and full sanatorium treatment, physiotherapy and antibiotics continued over a prolonged period of time.

This form of lung collapse is permanent, as the ribs regenerate in the vertical position, and there is a great tendency for the patient to develop scoliosis, but with adequate physiotherapy only the slightest deformity is apparent in the majority of cases.

Results of this seemingly barbarous operation are exceedingly gratifying, bearing in mind that these patients, mostly young adults, would have died within a few years had it not been undertaken, whereas in a number of observed cases thus treated, 80 per cent were alive after 5 years, 95 per cent of whom had closed cavities and negative sputum.

Thoracoplasty is also performed in the treatment of chronic empyema, usually caused by tuberculosis, or, more rarely, by actinomycosis.

Lung Abscess

The main causes of this condition have been described in Vol. III, Chapter 3.

Symptoms are pyrexia accompanied by night sweats, rigors, loss of weight and other indications of severe toxæmia. Cough is usually present; sputum may be very slight if the abscess is sealed from the bronchi, or profuse, purulent and offensive if draining into one. Pain is present only if the abscess is near to the surface of the lung. Diagnosis is confirmed by x-rays, which show the abscess cavity containing fluid.

Whatever the form of medical or surgical treatment adopted, the patient with a lung abscess requires skilled nursing throughout the course of the disease.

Absolute rest is essential, with copious fluids to combat the pyrexia and frequent baths to aid the skin in its work of eliminating the toxins. Regulation of bowel action, attention to oral hygiene, tepid sponging and the usual routine nursing attention accorded to an acutely ill patient are carried out gently and discriminately.

If the abscess drains into a bronchus, it may respond to postural

drainage, expectorants and antibiotics, or bronchoscopic drainage may be employed, followed by the above treatment.

In this method, the patient is given a light anaesthetic and in a darkened theatre the surgeon passes a lighted bronchoscope to a suitable level, then aspirates the abscess by suction through a long nozzle passed down the bronchoscope.

Surgical Drainage.—If the abscess is sealed from the bronchus, however, and does not respond to medical treatment, surgical drainage is performed in 2 stages.

In the first stage an incision is made into the chest wall to the pleura, then a sulphanilamide pack is inserted between these two structures, in order to make the visceral and parietal pleura adherent to one another by the irritation the pack evokes.

When, about a fortnight later, the wound is reopened and the pack removed, the abscess may be incised and drained without any fear of infecting the pleural space.

The abscess cavity is packed with sterile gauze, which is removed and gently renewed daily, as vigorous packing may cause the abscess to extend into a bronchus. The cavity may be irrigated provided no bronchial fistula is present.

Antibiotics and the nursing care previously mentioned are continued as long as the patient's condition necessitates these measures.

Breathing exercises and exercises to mobilize the arm on the affected side are given, and a long convalescence is necessary.

Malignant Disease of the Lung

Carcinoma of the bronchus is the commonest form of malignant disease of the lung, but occasionally the growth is sarcomatous. The incidence of this disease has increased alarmingly, and it is now twenty times as common as it was in the early part of the century. Cigarette smoking is largely blamed for this increase as the majority of its victims are men of middle age. In women the condition may occur as a complication of chorionepithelioma.

Symptoms are persistent cough and loss of weight occurring in a middle-aged patient, and when investigated by x-rays a shadow is seen in the lung fields. Diagnosis is confirmed by bronchoscopy.

Pneumonectomy.—Provided there are no secondary growths, and the growth in question is not too far advanced, the operation of pneumonectomy is performed as soon as possible following the preparations previously described.

The site of the operation is exposed by removal of a rib and retraction of those remaining by a rib separator (Fig. 66). The lung is freed of any adhesions which may be present, then the structures at the hilum are ligated and divided and the entire

organ removed. The thorax is closed without drainage, unlike the other intra-thoracic operations, as the cavity is allowed to fill with serous exudate which ultimately becomes organized and is replaced by fibrous tissue.

Blood transfusion is commenced before the surgeon begins to operate, and is continued as long as required. The patient is nursed in Fowler's position in an oxygen tent for at least the first 2 days following operation, and may be allowed to sit out of bed at the end of a week if progressing favourably.

Prophylactic doses of antibiotics are given before and after the

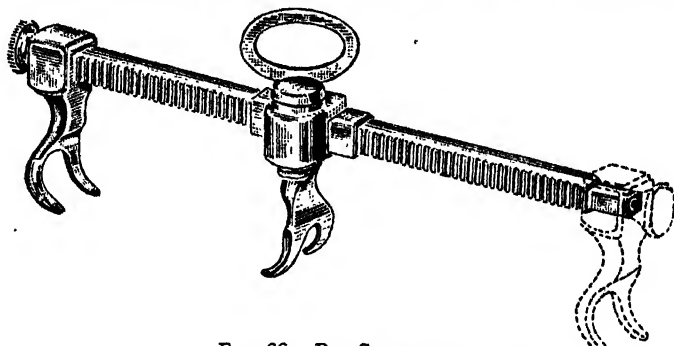


FIG. 66.—RIB SEPARATOR.

(By courtesy of The Genito-Urinary Mfg. Co., Ltd., London.)

operation, as are breathing exercises by the physiotherapist. Convalescence is prolonged and the patient will be required to attend the surgical out-patients' clinic for frequent clinical and x-ray examinations for about 2 years after the operation.

Injuries of the Thorax

Fractured Ribs.—The complications of this injury are more serious than the injury itself, as the actual fracture heals easily. One or many ribs may be involved.

The complications are:

1. *Pneumonia.*—This is most likely to occur in elderly patients.
2. *Surgical Emphysema.*—This occurs when a rib fragment penetrates the underlying lung, and air is admitted from the lungs to the tissues of the chest wall, causing crepitation under the skin.
3. *Haemothorax.*—Haemorrhage following lung injury fills the pleural cavity, collapsing the lung. Air may also be present, when the condition is known as pneumo-haemothorax.

The uncomplicated fracture may be treated by the application

of adhesive strapping so that the chest is completely circumscribed in the affected area.

As this method tends to limit the respiratory excursions of the chest and therefore increases the risk of the patient developing pneumonia, doctors sometimes prefer to inject 2 per cent "Novocain" into the fracture, and thus to relieve the pain whilst leaving the respirations unhindered.

Shock must be adequately dealt with at the time the injury occurs, but the patient is not confined to bed for longer than a day unless other injuries necessitate a more prolonged rest.

Haemothorax is treated by aspiration, but in some instances the blood is evacuated surgically. A small haemothorax will absorb naturally if treated by rest.

Penetrating chest wounds may cause lung abscess or empyema. Treatment is by excision and closure accompanied by the administration of antibiotic drugs.

Surgical Treatment of Abnormalities and Disease of the Heart and Large Vessels

Although these conditions cannot truly be classified as common surgical affections, we must give them some brief consideration here, as great advances have been made in this branch of surgery, as in others, during the past few years, and it is possible that operations performed for the relief of some of these conditions may one day be encountered almost as frequently as operations for appendicitis or hernia.

Take, for example, mitral stenosis, once purely a medical disease. In the operation performed by Brock of Guy's, and certain American surgeons, the thorax is opened, and an incision made in the left atrium after the preliminary insertion of a purse-string suture; the suture is tightened on the surgeon's finger as he passes it through the incision to the mitral valve, which is either stretched, or incised by a blade attached to the glove finger. Promising results have been observed in very ill patients.

Congenital Abnormalities.—In Blalock's operation for congenital pulmonary stenosis, the condition which causes "blue babies," the subclavian artery is anastomosed to the pulmonary artery, and children so treated are usually able to live the life of a normal child within a few months.

Children with patent ductus arteriosus are treated by ligation of the patent duct, with similar results.

Pulmonary Embolism.—When this catastrophe occurs, if the patient can be conveyed to the theatre with sufficient speed, the thorax is opened, the pulmonary artery incised, the clot removed, the artery sutured and the patient resuscitated.

As the patient is unconscious, no anaesthetic is necessary. This is essentially a life-saving operation, and is not undertaken if the embolus is small, as in this case medical treatment is usually adequate.

Ischaemic Heart Disease.—In disease of the coronary arteries, omentopexy is sometimes performed. The omentum is passed upward through an incision in the diaphragm and attached to the heart in order that the vessels it carries may supplement the blood supply to the heart muscle.

Suppurative Pericarditis.—This condition may occur as a complication of osteomyelitis. The signs are pain, breathlessness, cyanosis, rapid pulse and enlargement of the heart.

Treatment is either by repeated aspiration of the pericardium and injection of penicillin, or by rib resection and drainage; but only half of these patients recover.

Constrictive Pericarditis (Captive Heart).—In this affection, the pericardium becomes thickened and shrinks; in some instances the process goes on to calcification. It is thought to be due to tuberculous infection.

The signs of the disease are dyspnoea, ascites, enlarged liver and dilated veins in the neck.

The pericardium is peeled off at the front and sides, and the heart muscle is soaked with "Novocain" to prevent over-stimulation. Patients do not tolerate the operation well, otherwise results are very satisfactory and the cure most dramatic.

These operations are usually carried out in specially equipped hospitals. The patients require oxygen afterwards, administered mostly by the use of tents, and are carefully nursed in Fowler's position.

CHAPTER 9

SURGICAL TUBERCULOSIS

PRINCIPLES OF TREATMENT. INSOLATION. THE AIR BATH. ARTIFICIAL SUNLIGHT. TREATMENT AT THE SEASIDE. MEDICAL REMEDIES. DIET. BONE TUBERCULOSIS. TUBERCULOUS ARTHRITIS. SPINAL CARIES. TUBERCULOSIS OF THE HIP JOINT. TUBERCULOSIS OF OTHER JOINTS. DACTYLITIS. GLAND TUBERCULOSIS. OTHER TUBERCULOUS DISEASES.

Up to recent years, conservative treatment was the rule in tuberculosis, no matter where the lesions may have been, these being regarded as the local manifestation of a generalized disease.

This belief actually still holds good, but in a modified form, and more and more surgery is being employed in the treatment of this infection, particularly of course in the pulmonary disease which has been discussed in Chapter 8.

Whatever the surgical measures adopted, however, they are quite ineffectual unless accompanied by general treatment on sanatorium lines, and rest of the affected part by immobilization in splints, plaster-of-paris or frames, or by bone grafts and bone fusion. Orthopaedics, the science of adjustment of parts so that they become as near as possible capable of performing their original function, is thus of supreme importance in the treatment. Many new hospitals and institutions, combining educational and treatment facilities, have now been established, the principle being the development of the maximal degree of physical health together with stimulation of the mind by education of a special type. The cripple child may now be banished from our midst; what has been termed the "avoidable evil" of the maimed body may soon be proved to be also unnecessary. Unfortunately the scheme does not yet extend widely enough to train every adult to take his place as a useful citizen as well as to remedy his physical defects, but treatment is freely available, and developments have occurred and more and more progress has been made since the end of World War II. (See also Section XIV.)

Principles of Treatment.—In aiming at the maximal supply of fresh air and sunlight, special wards are constructed which are provided with folding walls, sliding roofs, numerous ventilators, heating panels in roof and floor and above all with as much

vita-glass space as possible. By simple machinery the strength of the sunlight and the freshness of the air can be controlled at will; without moving the bed the patient can be, for all practical purposes, right out in the fresh air or sunlight, or he can be within 4 walls, but amply supplied with the conditions so essential to success. At the same time exclusion of light can be brought about by dark blinds when necessary. There is no discomfort, nor are there any draughts; amenities of life are fully maintained. The patient does not feel that he has to suffer in order to become well.

Insolation.—The effect of the proper dose of sun on a tuberculous patient is to produce a general toning up of the system, but the local disease is definitely aborted also, the tissues apparently becoming more active in healing. Pain is also dulled. The amount of sun should be very carefully regulated, beginning with small exposures, these gradually being increased as the patient's tolerance is established. The head should be covered by a light-weight hat, and dark glasses should be worn over the eyes. In the event of pyrexia, restlessness, sweating, sickness, irritable temper or excessive fatigue the exposure should stop. Like plants, the patients respond much better to the spring than to the autumn sun and the best of the light is that of the morning; every patient must be made the subject of individual study, however.

The Air Bath.—The use of the term, air bathing, to express the practice of maximal exposure of the body to the open air has been devised by certain authorities who have guided us to a rational understanding of the good to be derived from nudism. The combination of sun and air is therefore ideal for the tuberculous patient. We all know how the appetite is increased by such agents, and an increased appetite is surely an evidence of increased metabolism and absorption of repair material and building stones for damaged areas. All authorities regard the effect of fresh air and sunlight as something as effective as massage and passive movements.

Artificial Sunlight.—In Great Britain, with its capricious climate, we often may have to supplement the natural sun by artificial light therapy. This branch of medicine, as mentioned already, is not the province of the ordinary nurse, but should be in the hands of specially qualified persons holding the appropriate certificates of proficiency in physiotherapy. The usual methods of producing light by carbon arc lamps or by mercury vapour, and of providing heat by various lamps giving radiant heat and infra-red rays, are in vogue, while for special local conditions, e.g. lupus vulgaris, the Finsen or the Kromayer lamp is of great service.

Treatment at the Seaside.—It has been found that those suffering from surgical tuberculosis, with certain outstanding exceptions, benefit not only by sea bathing but also from the sea air, which has a wonderful tonic effect. The dosage of the sea is of as much importance as the appropriate amount of iron and arsenic or of natural or artificial sunlight. Patients must be carefully tested and “typed” before they are allowed to take full liberties with the sea. It is well known, however, that to each individual are given clear natural indications of his aptitude or non-aptitude for marine bathing. We are all aware that some can almost live in the sea, whereas others become blue, shivery and unhappy after a few minutes. In dealing with tuberculous subjects, these points are all borne in mind. Even the fully “acclimatized” patients are protected, immediately they come out of the water, in specially constructed screened areas, and they have facilities for external and internal warmth provided immediately so that they quickly react, are ready when dry for a sun bath and then are able to have a substantial meal. The saline effect of the sea water cannot be over-estimated.

Medical Remedies.—The use of gold salts such as “Sano-crysin” has proved of benefit in cases of skin tuberculosis. Streptomycin used in conjunction with para-aminosalicylic acid, and *isonicotinic acid hydrazide* are nowadays used with gratifying results.

Diet.—Good, plain nourishing food is best. Certified milk should be given. Many authorities consider that special diet-systems are not productive of any more satisfactory results than those obtained with the ordinary food.

Bone Tuberculosis

We must now examine the special features of each manifestation of surgical tuberculosis, beginning with tuberculosis of bone. Since this is closely associated with tuberculosis of the joints, or tuberculous arthritis, both may be dealt with together.

Tuberculous Arthritis.—Inflammation of the joint may begin in the synovial membrane or in the ends of the bones. There is nothing dramatic about the onset and nurses would do well to master the early signs, since 85 per cent of joint diseases are tuberculous. A dull pain in the joint, with stiffness at night when the child is tired, may be lightly dismissed by parents as “growing pains.” Closer investigation would show that the synovial membrane was thickened and that there was definite swelling of the joint. During the night the pain, swelling and stiffness may pass off. Often the pain is referred from the hip to the knee and when the child complains of the above signs, an appreciable amount of heat may be felt by the examining hand.

As the disease progresses it is evident that muscular wasting and weakness is progressive. If allowed to go on, the bone and other structures disintegrate and form cold abscesses, and the joint thus becomes an abscess cavity. The pus, burrowing its way to the surface, forms sinuses which may discharge for months. If early treatment on the lines described above is instituted, all these disasters may be avoided. Let all nurses, therefore, doing their duty as good citizens, warn parents of the dangers of neglecting apparently trivial pains in the joints of their children, especially those under the age of 10. In the absence of early skilled treatment, the only result will be stiff joints with fibrous or bony ankylosis, gross deformities and more recruits to the army of cripples.

Treatment.—In addition to the already described methods of general treatment, including administration of the chemotherapeutic drugs mentioned, there are certain helpful local measures, such as applying aspiration, putting on Scott's dressing or filling cavities with a mixture of iodoform (10 per cent) in glycerine. Special splints immobilize the joint; traction may be indicated when the muscular contraction causes the ends of the bone to wear each other out by crumbling the soft inflamed cartilage. When the healing process is complete and the disease is quiescent some form of ambulant splint is required to protect the delicate parts and prevent deformities.

Spinal Caries.—Tuberculosis of the spine, known as "Pott's Disease," may affect young adults or children, very commonly the latter. Generally the lower thoracic vertebrae are the site of the trouble. In such cases the closely applied vertebrae cannot very well be kept apart, and in the constantly changing attitudes of the body rest is impossible, therefore erosion and abscesses form within the bones, causing great destruction and disappearance commonly of more than one intervertebral disk, with crumbling of the bone on either side. A great bony abscess cavity is formed. Needless to say the integrity of the spinal column, so finely adjusted, is lost. The disease may also develop under the periosteum on the front of the vertebrae. In either case the spine collapses, showing either marked angular curvature at the point where the "hinge" has been formed or a general spinal curvature with an area at which several spines of the vertebrae can be seen and felt to be wasted. To begin with, the patients have pain in the spine, which like all joints becomes unusually stiff. One feature of the trouble is that the pain is radiated all over the body and only on very careful examination by palpation is it discovered by the doctor that there is tenderness over a spinous process. The stiffness in the back may grow into a true rigidity, with poker-like carriage, the patient showing reluctance to bend; this is one of the classical

signs. When abscess formation is allowed to go on, the pus may burrow its way for a long distance, taking the route of the psoas aponeurosis and coming to the surface at the upper part of the thigh—the so-called psoas abscess. A shorter route terminates on the back as lumbar abscess. Higher up in the spine the pus may burrow forward from the cervical region and burst in the pharynx, forming a retropharyngeal sinus, or it may open externally at the side of the neck. All these are serious and even dangerous to life. Pressure on the spinal cord may also lead to paralysis of the lower limbs.

The treatment of spinal caries is first and foremost that of

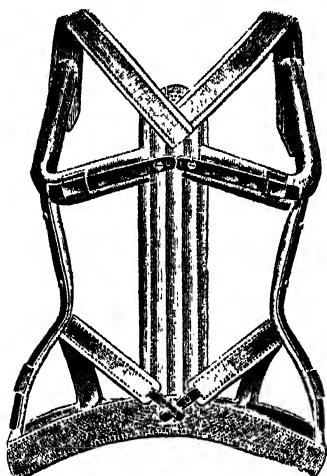


FIG. 67.—LIGHT STEEL SPINAL FRAME.

(By courtesy of the Surgical Manufacturing Co., Ltd., London.)

keeping the child lying flat on his back. All children under 14 should be placed in one of the approved frames, in a plaster jacket or on a plaster bed (see Vol. III, p. 10). The nurse in charge must be alive to the possibilities of bedsores or other skin reactions, of undue stiffness of the legs (which should always be slightly flexed at the knees, either by placing a pillow behind them or by adjusting the frame) and of stiffness of the ankles, which should have routine exercises. Caries of the upper third of the spine is specially treated by applying extension by weights attached to a bridle.

Great patience is essential in the treatment, which may be

continued, under the conditions mentioned at the beginning of this Section, for 3 years. When the disease becomes quiescent, when there is no further evidence of weakness and when the site of the disease has been fortified by new bony deposits so that it is firm and reliable, the patient may be allowed to assume the vertical position, but his progress is necessarily a very gradual one and to begin with, jackets of poroplastic material, leather and other resistant materials, usually fortified by a steel frame or by a jury mast when the cervical region is affected, must be worn for about a year (see Fig. 67).

The great aim should be to reduce or correct deformity, which when permanent results in the condition of kyphosis (hump-back) or scoliosis already referred to (see pp. 91 to 93). All appliances are shaped so that by pressure of rigid metal just above or below

the prominence formed by the diseased bones, a compensatory curve is produced which ultimately counteracts the faulty alignment due to disease.

The operation of Hibbs and Albee consists in splitting the spinous processes of the vertebrae and of inserting as a narrow wedge a fresh strip of bone from the tibia. A natural splint is thus applied to the back and by growth the support is increased. Many hold that this is the best treatment for all patients over the age of 14.

When abscesses form they require to be dealt with by aspiration and a long course of treatment, during which the sinuses usually persist. The general treatment is as important as the local treatment.

Tuberculosis of the Hip Joint.—One of the first symptoms of tubercular hip joint disease may be the fact that the child starts up with a cry just as he falls off to sleep. The pain ultimately becomes more severe and makes the child miserable, since it extends to the thigh and knee on the inner side. A limp is developed early, however, and may be the first thing noted by the mother; as the condition becomes established the typical features appear—wasting of the thigh and gluteal muscles on the affected side, apparent lengthening of the limb (which is turned outwards, slightly flexed and abducted) and restricted movement. The position adopted gives the patient most relief owing to relaxation of the ligaments. The limb is only apparently lengthened, because the pelvis is tilted towards the affected side; at the same time there is slight scoliosis of the lumbar region, while the pelvis is tilted forward to the maximum. The latter produces the state of lordosis, the hollow above the hips being deepened. If the disease be allowed to go on, adduction and inversion of the limb may occur, and since the pelvis must now be tilted in the opposite direction to accommodate for this, there is now apparent shortening. Finally a gross disruption, with breakdown of the head of the bone and even abscess formation, may result in a real shortening. Conservative treatment leads to ankylosis and quiescence of the disease (see Fig. 68); recovery is satisfactory if the full treatment, as outlined at the beginning of this chapter, be carried out.

Treatment.—In addition to the usual constitutional remedies, there are 2 modern methods of treatment locally. The first is sponsored by a school of surgeons who consider that by fixing the joint to a certain extent, but not too rigidly, and by putting on the right kind of extension apparatus, the joint will heal up and have a certain amount of mobility. The second is founded on the theories of Hibbs and Albee that the hip joint is always a potential source of renewal of the disease, despite fibrous ankylosis; these men also found that deformity and stiffness

were rarely prevented. They therefore immobilized the hip joint by a bone graft folded back from the greater trochanter and fixed in the ilium just above the acetabulum, making ankylosis certain.

As we have already observed, however, the predominant idea is to stick to conservative treatment, especially in children.



FIG. 68.—AN X-RAY WHICH ILLUSTRATES HOW MUCH DISORGANIZATION MAY OCCUR AS A RESULT OF LONG CONTINUED HIP JOINT DISEASE, IN THIS CASE TUBERCULOSIS. THERE IS NOW A WELL MARKED CONDITION OF CHRONIC OSTEOARTHRITIS.

Extension (by one of the methods described in Vol. III, pp. 1-3) in the line of the affected thigh is used to reduce gradually the flexion but especially to keep the inflamed surfaces of bone apart and thus to relieve the pain. Various splints or frames may also be used (see Vol. II, pp. 409-419). In the simple method of weight and pulley extension, the thigh is supported on an inclined plane or by pillows so that while all strain is off the hip, it can gradually be extended by progressive lowering of

the pulley on the end of the bed. If the extension be properly applied there should be no risk of scoliosis or of knock-knee.

Once the position of the hip is rectified an ambulant splint may be applied to the affected side (Thomas's, celluloid or plaster casing), while a patten is fixed to the boot on the sound side, the patient using crutches. In this way, he is gradually re-educated to the new conditions. If there should be any permanent shortening the sole of the boot on the affected side may have to be thickened. It must be remembered that apparatus may have to be kept in use for some years and therefore constant adjustments are necessary.

Tuberculosis of Other Joints.—The knee is frequently affected, the course being much the same as that of the hip, but the signs depend upon the arrangement of the local structures. The muscular spasm tends to produce flexion, lateral rotation and backward displacement of the tibia. Patients who have not reached adolescence should be put to bed and a plaster casing applied from the middle of the abdomen to below the ankle, or a Thomas's knee splint may be used. The flexion should be gradually overcome by the use of the Balkan Frame (see Vol. II, p. 418). There is a danger of genu recurvatum, or excessive extension of the knee joint, in which case operative measures have to be undertaken. It is therefore recommended by several authorities that excision of the knee joint should be done during adolescence only. This operation is strongly supported by a group of surgeons for all cases of tuberculosis of the knee, provided it is not undertaken too early. Firm, bony ankylosis is thus produced.

The elbow is probably the joint most affected after the hip and knee. The disease begins either in the olecranon or at the superior radio-ulnar joint, and is treated first by conservative methods, with fixation of the joint at a right angle by the simple collar-and-cuff sling. When ankylosis is produced the elbow is thus in the best position.

At the ankle joint, including the tarsus, rest in bed, with the foot elevated and immobilized, is the treatment. The shoulder, wrist and sacro-iliac joints are rarely affected. Again immobilization for a period in the most appropriate position is indicated. Excision should always be the last resort.

Dactylitis.—Babies often appear at the out-patient department with one of their fingers swollen, red and tender, and forming a spindle-shaped deformity. This is due to the conversion of the phalanx (or sometimes a metacarpal bone) into a cold abscess cavity or a closed space containing disintegrated bone. In some cases the pus bores its way through and a sinus is formed. Usually this condition clears up with efficient immobilization and the general constitutional treatment that should be the first consider-

ation in all tuberculous bone disease together with the use of streptomycin and para-aminosalicylic acid (P.A.S.), or isonicotinic acid hydrazide, which are of exceeding value in the treatment of orthopaedic tuberculosis. (See also Vol. IV, Section XIII.)

Gland Tuberculosis

Groups of glands may become swollen in the neck, a very common occurrence in young children, who may also be found to have some septic focus of the teeth, tonsils, adenoid tissues, ear or skin. As the glands enlarge they become soft and fluctuant, and finally the pus bores its way through, forming several sinuses popularly known as "runnings." At one time this condition was dealt with solely by excision, but recurrences were frequent and nowadays patients are treated conservatively by the methods described already, every possible source of infection being removed. Chemotherapy, tonics such as cod-liver or halibut-liver oil and malt, assisted by heliotherapy, natural and artificial, radium and local antiseptic dressings, may cure the condition, a small puckered scar marking the site of the sinus. Any disfigurement can be put right by subsequent plastic surgery. There is no doubt that many of us must suffer at one time from mild tuberculous lymphadenitis of the bronchial and mesenteric groups, since necropsies usually demonstrate one or two calcified glands. These rarely lead to very active conditions; now and then the axillary or inguinal groups are attacked.

Other Tuberculous Diseases

Peritoneal tuberculosis in babies results from infected milk and may be accompanied by severe ascites, already described. Sometimes the tissues are matted together by plastic peritonitis. Many complications are found, the temperature running an irregular course; progressive emaciation resulting from intermittent diarrhoea is very common. Conservative treatment with complete rest is the best treatment. Renal tuberculosis is serious, T.B. being found in the urine; the symptoms of pain, frequency and haematuria are those of kidney disease in general. Nephrectomy must be done. Tuberculosis of the bladder or of the epididymis may be associated with renal tuberculosis.

CHAPTER 10

AFFECTIONS OF THE EYE

GENERAL CONSIDERATIONS. ROUTINE EXAMINATION. ROUTINE TREATMENT. COMMON DISEASES OF THE EYE. CONJUNCTIVITIS. THERAPY IN OPHTHALMIC DISEASES. DISEASES OF THE LIDS AND NEIGHBOURING STRUCTURES. DISEASES OF THE CORNEA. IRITIS. DISEASES OF THE POSTERIOR PART OF THE EYEBALL. GLAUCOMA. CATARACT. OPERATIONS: PREPARATORY MEASURES AND AFTER-TREATMENT. STRABISMUS. REFRACTIVE ERRORS.

THE defects of the eye may be divided roughly into two parts viz. 1. Diseases of the eye; 2. Structural abnormalities causing errors of refraction which require correction by glasses. The latter condition is not regarded as a disease but rather as an alteration in the structure of the eye to meet unusual strain put upon it by various factors.

General Considerations.—When a patient appears at the eye department complaining of something having gone wrong with the eyesight, we must make a routine examination to find out if there is any disease present. Some diseases are self-evident, but others require special instruments for their discovery. If all the parts of the eye are found to be normal as regards tissue health, we then proceed to test the vision and to make an assessment of the defect so that corrective lenses may be worn in front of the eye. The optician is concerned solely with the latter condition, the ophthalmologist with all the branches of eye disease and defect.

In the waiting-room of a large eye clinic may be found all kinds of ophthalmic abnormalities. Here for instance is a school-child referred to the specialist on account of marked squint of one eye, the result of lack of co-ordination of the various muscles which move the eyeball; a young journalist may have called to find out why he has headaches and an inability to see things clearly 3 feet away; an old lady sits waiting to find out whether the opaque cataract in the lens of her eye is ripe for removal; a labourer crouches in the corner, shielding his eye from the light because he has an ulcer of the cornea caused by a tiny piece of hot coal which was blown into this tissue. Any part of the eye

may be demonstrated as the site of disease or defect and therefore we must be prepared to make a routine examination of the lids, outside and in, the rims of the lids, with the various glands and the tear apparatus, the drainage system of the eye socket, the coverings of the eye, the cornea, the lens, the sclerotic, the iris, the inside of the eyeball and the delicate membranes of the back of the eye, including the retina, choroid coat and the optic nerve. If nothing can be made out, we must ascertain something about the tension of the eye or find out whether the shape is unusual, the visual axis abnormal or the accommodative mechanism out of order.

Routine Examination.—Although the nurse is concerned almost entirely with the treatment of the eye conditions, she should take an intelligent interest in the work of the specialist as he makes his examination. To carry out this properly, various drugs, appliances and instruments are necessary. The drugs are



FIG. 69.—CARGILL'S OPHTHALMIC DROP BOTTLES.
(By courtesy of the Surgical Manufacturing Co., Ltd., London.)

usually in the form of drops, which, contained in special drop-flasks, are represented by the various solutions for contracting or dilating the pupil, these being applied by special pipettes (Fig. 69). The appliances consist of trays containing graduated corrective lenses, trial frame and special apparatus for examining the inside of the eye—ophthalmoscope, ophthalmometer and the more modern slit-lamp; for estimating the field of vision—perimeter; and for testing the vision—letters and figures in frames on the wall. Every ophthalmic clinic is provided with several small dark rooms, generally painted black all over in their interior, for the efficient examination of the inside of the eyeball. A concentrated electric light beam is used.

Routine Treatment.—After the surgeon has made his diagnosis, certain special forms of treatment may be determined. These are of varying degree, some requiring delicate aseptic operations and after-treatment in theatre and eye ward, others amounting to simple treatment on the spot. The nurse will find that special instruments have been devised for eye work, a selection of these being shown in the various illustrations of this chap-

ter. She will also learn that lotions, dressings, drops, oculents, ointments and electrical appliances are in constant use. These are all referred to below.

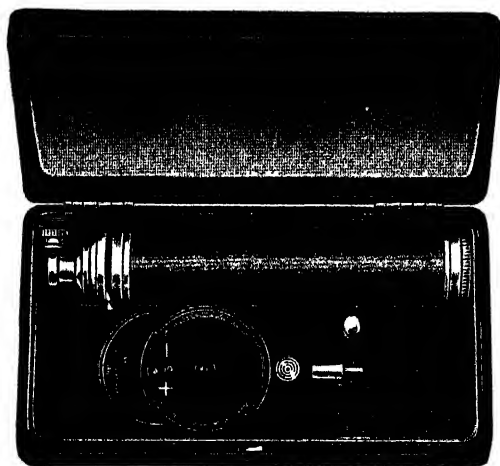


FIG. 70.—MAY'S ELECTRIC OPHTHALMOSCOPE.
(By courtesy of the Surgical Manufacturing Co., Ltd., London.)

Common Diseases of the Eye.—A brief survey may now be made of the common troubles which afflict the eye and of their special treatment apart from the usual routine of ordinary surgical procedure. One general point must be stressed in the first place. The eye is one of the most delicate and sensitive organs of the body. Like all other highly specialized structures, it is easily damaged, and it is peculiarly liable to germ attack, which may quickly end in blindness, therefore the most scrupulous care must be taken at all times to avoid sepsis.

Conjunctivitis.—One of the commonest diseases of the eye is acute inflammation of the delicate membrane, the conjunctiva, which covers the front of the eyeball and which is reflected over the inside of the lids. Almost every discharge from such inflammation is infectious, therefore great care must be taken to prevent the spread by hands, dressings, towels and various other sources of disease.

Varieties.—The simplest form is that due to irritation e.g. the mote in the eye or the constant rubbing of an ingrowing eyelash. Chemicals, fumes, gases and so on may also cause the condition. This passes off quickly when the source of the irritation is removed. Otherwise irritative conjunctivitis may be chronic as a

result of long exposure to bad air, to a dusty occupation, to work carried on in very bright light, or among fumes of tar, sulphur and other chemicals. Defective vision may ultimately lead to chronic conjunctivitis, and it is often found when the patient is debilitated or poorly nourished. When all these factors are removed the conjunctivitis disappears, therefore the nurse must bear in mind that local treatment is not everything, although irrigation for a few days with a weak solution of boric acid, alone or combined with a small percentage of zinc sulphate or better still the more modern treatment by installation of eye drops of zinc sulphate solution, .25 per cent strength, may clear up the local condition. At night, ointments may be applied, such being now available in the form of oculents i.e. special mixtures consisting of 90 per cent soft yellow paraffin and 10 per cent anhydrous wool fat, carefully sterilized and containing appropriate amounts of atropine, yellow oxide of mercury, cocaine, hyoscine hydrobromide, iodoform, physostigmine salicylate or combinations of these drugs.

One of the commonest types, and frequently seen in school-children, is the acute catarrhal conjunctivitis, commonly referred to as "pink eye." The front of the eye is covered with fine reddish streaks and the patient feels that the eye is full of grit. At night the eyelids become stuck together. If there is much muco-pus, little beads of it are seen at the medial and lateral canthus, and these may be the sources of widespread infection of the condition known as "Koch-Weeks conjunctivitis," so-called because the causative germ is associated with these names. Institutions may be ravaged by this complaint, which spreads rapidly. Unless care is taken to give early treatment, the trouble may spread to the cornea, causing ulceration.

Treatment.—The eyelids should be painted with silver nitrate (2 per cent) every other day, and one of the following drops should be instilled 3 to 4 times daily: "Albucid" or sulphacetamide 30 per cent, "Argyrol" 10 per cent or mercurochrome 1 per cent, or alternatively 1 drop every hour for 24 hours of penicillin in the strength of 1,500 to 2,500 units per cubic centimetre. In no circumstances should the eyes be covered in the treatment of conjunctivitis, as this may cause ulceration of the cornea. The towels, clothing, handkerchiefs, sponges and so on of the patient must be kept apart from those of the rest of the family or inhabitants.

Phlyctenular conjunctivitis is characterized by the formation of yellow pustules close to the medial and lateral margins of the cornea. It is a sign of poor resistance and of bad hygienic conditions and unless prompt measures are taken to improve matters, ulceration is a danger. There may be spasm of the lids, and administration of cocaine oculent may be necessary in order

that the eyelids may be opened for the irrigation which is necessary, boric acid or perchloride of mercury (1 in 10,000) being favourites. Very often phlyctenular conjunctivitis is regarded as a sign of the tuberculous diathesis, and the patients are fed well, kept out in the fresh air and given cod-liver oil and malt. Twice a day, a piece of oculent of atropine and yellow oxide of mercury should be placed in the corner of the eye socket by a thin glass rod or bone pen. If the cornea should be involved, drops of atropine 1 per cent should be instilled 2 or 3 times daily. In this, as in all other procedures, the eyelids should be moved up and down so that the ointment is spread well over the surface. In giving the lotion, see that the solution flows gently and evenly in steady flow from one side (usually the medial) to the other; it is always safe to put ointment, drops or lamellae into the little pocket formed when the lower lid is pulled down; the eyelid should then be kept shut and the patient told to roll the eye gently until the drug is distributed evenly.

Purulent Conjunctivitis.—This includes the adult type and ophthalmia neonatorum, the latter being described legally as "discharge from the eyes within 21 days of birth." The symptoms of adult conjunctivitis are discharge of pus from the eyes, swollen lids, elevated temperature and increased pulse; the patient appears to be very ill, as in fact he is.

Treatment.—If the disease be unilateral, the unaffected eye should be protected by a Buller's shield (Fig. 71); sulphonamide or penicillin therapy is instituted and nursing begun on general lines for any condition of pyrexia, with the addition that the nurse must take precautions against infection of her own eyes, by paying particular attention to her hands, for the condition is highly infectious.

Sulphanilamide treatment consists in giving large doses of sulphamezathine or sulphathiazole by mouth, these being less toxic than other forms of the drug. Locally the treatment consists in irrigation with half normal solution of saline, and putting in atropine drops, 1 per cent 3 times daily, followed by "Albucid" or sulphacetamide (30 per cent).

So far as penicillin is concerned, the routine is to give 1 drop of 1,500 to 2,600 units per cubic centimetre every 5 minutes for a $\frac{1}{2}$ hour, then half-hourly for 3 hours, or until the discharge ceases. The treatment is continued by giving 1 drop hourly for 12 hours, then 2-hourly for 3 days. Systemic penicillin is given in addition to the local application in the case of an adult, but in ophthalmia neonatorum, it is administered as described above into the conjunctival sac only. Alternative treatment is irrigation of the eye with half-normal saline 3-hourly for the first day, and atropine drops (1 per cent). Sulphamethazine crushed in water is given by mouth, 0.25 gramme as an initial dose, followed by

0.125 gramme 4-hourly day and night until 48 hours after the discharge has ceased.

Another type is granular conjunctivitis (trachoma). In this, small granules like sago grains appear on the palpebral conjunctiva only, but they are very difficult to treat and nearly always result in corneal involvement, with inversion of the lids (entropion) due to the contractures; vision may also be affected. Fortunately the disease is rare in Great Britain.

The treatment consists of prevention of spread of the infection, irrigation and application of ointment. All these eye diseases demand that the nurse should be ultra-careful of her hands and clothing. Sometimes the surgeon applies copper sulphate to the more exuberant granules.

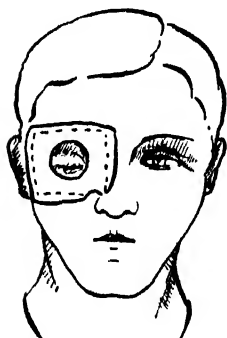


FIG. 71.—BULLER'S SHIELD. This is put over the sound eye; it is made by covering a watch glass with adhesive plaster, leaving a circle to allow light through.

The modern treatment of trachoma consists in daily painting of the eyelids with a saturated solution of quinine bisulphate, followed in 2 or 3 weeks time by 0.5 to 2 per cent perchloride of mercury in glycerine, or by instilling drops of 30 per cent "Albucid" or sulphacetamide in conjunction with sulphonamides by mouth in large doses, as for gonococcal infection.

Diphtheritic conjunctivitis is the remaining representative; it is characterized by the formation of a membrane of diphtheroid type, generally due to the Klebs-Löffler bacillus, and is treated by antiseptic washes and antitoxin.

Hot Bathing (Moorfield's Treatment).—A pad of cotton wool is tied into the bowl of a wooden spoon. The wool is dipped into a bowl of boiling water, and is then brought near to the closed eye so that the steam rising from the hot wool warms the eye. As soon as the wool has cooled sufficiently it is brought into contact with the closed lids and as soon as it ceases to feel hot it is again dipped in the hot-water and the process repeated. The bathing is continued for 10 to 15 minutes and then a pad of dry warm cotton wool is bandaged over the eye. The hot bathing may be repeated 3 or 4 hourly.

Diathermy and electric pads are also used.

Therapy in Ophthalmic Diseases.—The various types of ophthalmitis demand almost every kind of treatment used in eye work and at this point these may be conveniently summed up.

Irrigations have already been described. They should be given in correct strength and as hot as the patient can stand.

Compresses may be hot or cold. The hot application is put on for about 10 minutes every 2 hours, and may consist of 2 or 3 layers of white lint or boracic lint cut into a circle the size of the eye socket. They should be kept in position by the nurse, and she should change them every 2 minutes, keeping the lint warm by ample covering of cotton wool. Warm cotton wool is applied afterwards and kept in position for 30 to 40 minutes. The cold compress is made in the same way, but a constant fresh supply is provided by keeping an enamel bowl half-full of ice and having a number of square compresses ready, as they must be changed every minute, so that a constant ice-cold effect is produced. The eyes should be kept shut during the treatment.

Leeching, cupping and blistering are done in the usual way. Three leeches may be applied in a row above the eyebrow. Cupping and blistering may be done farther afield, the temple and forehead of one side being the most useful sites.

Painting of the lids is a special treatment. The lids can be everted and retained in this position on account of the presence of the stout palpebral cartilages. Assuming that the patient is lying on his back, he is told to look down while the nurse places horizontally across the upper part of the upper lid a small bone pen or thin glass rod; by pulling steadily but carefully on the upper eyelashes the lid is everted as if on a spring hinge. The lower lid may be treated in a similar way but in the opposite direction. The paint may then be applied and left for a little, after which it is washed away with weak boric acid solution or normal saline.

Eye shades are of all kinds, but many are devised to satisfy personal vanity and are more elegant than useful. Single close-fitting eye protectors are not of much use in inflamed states, the best being a simple brown paper or green celluloid double shade, which fits well back on the temples, and which is deep enough to prevent the patient looking up even if he wants to do so. A simple tape threaded through or fixed to the upper margin and tied at the occiput keeps the shade in position. For children especially the large double shade is a most important appliance. This may be made out of stiff brown paper.

Buller's shield, already mentioned, is made by taking a 5-inch square of adhesive plaster and cutting out a circle in the middle slightly less than the watch glass which is to be used as a window. After the edges of this opening have been nicked, the glass is heated and it is placed, concave surface upwards, on the adhesive side of the plaster and then carefully cemented to it. When set, there can be applied over the rim of the watch glass several thin strips of plaster. In the application a space must be left at the

lower and lateral margin to let any moisture or tears drain away, otherwise the plaster is very securely fitted all round, especially at the inner aspect. The plaster may be cut to allow it to be moulded on the cheek, forehead and nose.

Before an artificial eye is put in, it should be soaked in boracic lotion and the socket well irrigated. The eye is fixed by pulling the upper eyelid forward and slipping the upper part of the glass eye in, the lower portion of the eye then being pressed down gently behind the lower lid, which is pulled forward. It is removed in the opposite order. Patients become expert in the management of such eyes, which should be removed at bedtime and left in boracic solution all night after they have been washed in soap and water.

Diseases of the Lids and Neighbouring Structures.—The margins of the lids alone may be affected by inflammation (blepharitis). Hordeolum, or sty, is a septic hair follicle and usually indicates that the patient is requiring glasses or that his general health is below standard. In many cases the eyelashes have to be removed by forceps, but they often fall out. Ectropion, or turning outwards of the lids, may be due to prolonged blepharitis and it also occurs after injuries or skin diseases of the cheek, the cicatrix drawing the lower lid down. This is treated by a minor plastic operation. A V-shaped incision is made on the outer surface of the lower lid and sutured as a "T." This restores the lashes to their normal position and enables the lids to be closed. The drainage system of the eye may become blocked as a result of inflammation, so that tears do not pass through the lacrimal duct into the nose, but stream down the face; this is known as dacryocystitis. Constant watering of the eye is called epiphora and is associated with inflammation of the lacrimal apparatus at the medial canthus, or with a simple blockage. The nasal duct may have to be opened by incision. A very common cystic condition, chalazion, is found usually at the upper eyelid as the result of inflammation of one of the meibomian glands. The swelling, when it reaches the size of a pea, is usually incised and scraped out, special forceps, scalpel and curette being used. In all other conditions of the eyelids and lacrimal apparatus, frequent irrigation, application of ointment or other procedures are indicated, together with administration of general tonics.

Diseases of the Cornea.—Ulceration of the cornea may result from injury, conjunctivitis and various other conditions. The symptoms are pain, photophobia (avoidance of light) and profuse watering of the eye. The patient screws up his lids and retires to the darkest part of the room. When the ulcer penetrates the cornea, the fluid of the anterior aqueous chamber runs out and the iris is floated forward so that it may become adherent to the

back of the cornea; the lens may follow the iris. If sepsis should be allowed to occur, a yellowish-white "pond" of pus is collected in front of the lower half of the iris (hypopyon); this, combined with perforation, makes a very serious state of affairs. The treatment in the latter case is by galvano-cautery. In bad cases of hypopyon with an intact cornea, the surgeon may decide to incise the cornea and let out the pus. Otherwise the general treatment of all ulceration of the cornea is frequent irrigation together with instillation of atropine drops (1 per cent) to keep the iris dilated as much as possible. Sometimes the oculent of atropine and mercury is used. The eyes should be dressed with a soft pad and firmly bandaged. In some cases antiseptic drops may be used, as well as penicillin, "Albucid" (10 to 30 per cent) and mercurochrome. Hot fomentations may be necessary; the patient should be kept at rest.

Interstitial keratitis is inflammation of the framework of the cornea, frequently seen in children of school age and due to inherited syphilis. The cornea is "steamed," or looks like a ground glass window; both eyes are generally affected, one after the other. Local measures are combined with anti-syphilitic treatment (see Vol. III, Chapter 14).

Permanent white scarring of various degrees may result from ulceration or keratitis. If the ulcer be the size of a pinhead, it may leave behind only a small white speck, but generally these opacities, as they are called, are divided up into 3 classes, viz. the nebula or slight cloudiness; the macula, not quite opaque, but distinctly white; and the leucoma, which is almost impermeable to light. It is obvious that when an opacity is central, vision will be poor and matters are complicated when the iris or lens, or both, are involved in the scar.

Iritis.—Iritis is inflammation of the iris, and may occur after a wound of the eye or during the course of rheumatism or syphilis. The general appearance is that the iris is surrounded by a ring of hyperaemia (ciliary injection), the colour is dusky, the movements are sluggish or lost. The symptoms of pain, photophobia and watering of the eye are prominent. If there be much effusion from the back of the iris the latter may become glued to the capsule of the lens and thus the pupil may be drawn into various shapes; one is shown in the illustration (Fig. 72). This condition is known as posterior synechia. The treatment of iritis therefore

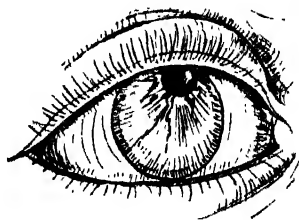


FIG. 72.—DISPLACED PUPIL RESULTING FROM INFLAMMATION OF IRIS (Synechia).

resolves itself into 3 great essentials : 1. we must soothe the pain and deal with the local inflammation ; 2. we must treat the constitutional cause and 3. above all we must try to prevent the occurrence of posterior synechiae. Oculent of atropine is therefore put into the affected eye every 4 hours until the pupil is fully dilated, after which the frequency may be diminished. Leeching, cupping, hot fomentations, complete rest and quiet in bed with the eyes lightly bandaged and free purgation must all be part of the treatment if success is to be assured. If there should be a posterior synechia, the operation of iridectomy may be performed later on, this involving a cutting away of part of the iris so that more light is allowed to pass through.

Diseases of the Posterior Part of the Eyeball.—The dark curtains of the posterior internal wall of the eyeball may be affected by injury or disease. The choroid coat ends in the ciliary processes, which, when they become inflamed, give rise to cyclitis, a condition very like iritis and treated in much the same way. In certain eye defects the retina may become detached from the choroid ; a blow on the eye in boxing may also produce this condition. Vision may be restricted to mere perception of light. The ophthalmoscope shows all these conditions clearly. Many complications are possible and the greatest care must be taken to keep the patient quiet in bed on his back for a month or longer, the slightest movement being forbidden. Retinitis, with flame-shaped haemorrhages, is a feature of many toxic diseases, and in kidney disease, diabetes and other conditions a report from the ophthalmologist is always called for. Optic neuritis is a sign of disease of the brain ; it may progress to optic atrophy, with permanent blindness. Nurses should bear in mind that all diseases of the back of the eyeball are very serious and generally lead to impairment of vision of serious degree.

Glaucoma.—Any abnormal intra-ocular pressure is spoken of as glaucoma. The fingers of the expert, placed over the eyeball, discern an increase of tension. This disease is rarely seen before the age of 55, and it may be primary or the result of other eye disease. Eye strain from various causes may lead to the condition in those who inherit the tendency to glaucoma. The symptoms are pain, a feeling of "expansion" of the eyeballs and an iridescent halo round objects. The signs, in addition to increased tension, are inflammation, dilated pupil and swollen lids. The eye may protrude. When the field of vision is tested by the perimeter it is found to be very much restricted. The treatment varies according to the patient. The sooner the tension is reduced the better the outlook. In order to contract the pupil, pilocarpine and its allies may be used, but when this is not successful, a local anaesthetic should be given and the operation of iridectomy performed. In chronic cases the sclerotic may be punctured or

trephined. The eyes should be protected by dark glasses until the eye has settled down and can be corrected by ordinary lenses.

Cataract.—The slightest disruption in the lens may lead to the formation of a cataract, which is the name given to the condition of universal opacity of the lens of varying degree, caused by different factors and found in babies and in old people. Thus there is the congenital type, the juvenile type, the traumatic type, the diabetic type, the senile type and so on. In the case of the partial or "soft" cataracts of the young adult or juvenile, needling is resorted to. By this method the anterior lens capsule is torn by a sharp needle and the aqueous fluid thus percolates the substance of the lens and dissolves it; the obstruction to the light rays is thus effectively removed.

In old people, however, the cataract begins as a mild clouding, and gradually progresses until a hard, opaque, so-called "ripe" cataract is produced. The symptoms are those of gradually fading vision, especially with fixed blind spots in front of the eyes. Glasses do not help, and although the patient can see better in a dimly lighted room, it is obvious that almost complete blindness is inevitable. One eye is generally farther on in its progress than the other. In cataract it is rather incongruous to reflect that betterment is indicated by increase of the opacity, but this is so, because the sooner the lens becomes ripe and hard the sooner is it ready for the simple shelling-out process of cataract extraction. The ophthalmologist always waits until the lens is very white and hard before he operates. Now and then iridectomy is done some weeks before, but usually it is possible to do the combined operation. This is performed under local anaesthesia, cocaine and adrenalin being instilled into the conjunctival sac. Details are given below.

For the preliminary iridectomy, an incision is made by putting in a sharp-pointed knife at one side of the corneoscleral junction, pushing it through until it emerges on the other side, and then, the blade edge being upwards, slitting the tissues so that a half-moon incision appears like a valve on the upper half of the eye. A small portion of the iris is taken out. The hard nucleus is then manoeuvred out of the slit and any debris is gently curetted away.

Operations: Preparatory Measures and After-treatment.

—For all operations on the eye, local and general preparations must be made. If necessary, any abnormal constituents of the urine must be carefully assessed and any albumin or sugar investigated. The neighbouring structures—nose, mouth, throat, teeth—must be free of serious disease. Any acute conjunctivitis should be cured before the operation is undertaken. As a general rule the patient goes to bed early the night before, but it is better when he rests for the whole of the day previous to the operation. Ethereal soap, if used for the cleansing of the eyelids and sur-

rounding skin, should be very carefully employed, great care being taken that it does not get into the socket. The brow of the affected eye is shaved, or more commonly, the hairs are painted with collodion to avoid the temporary disfigurement caused by the first method, and the lashes are removed from both lids by sterile scissors (blunt pointed) smeared with sterile "Vaseline." When the lacrimal sac is to be excised, lacrimal irrigation must be performed twice daily for 2 or 3 days before operation. Generally it is advisable to irrigate the eye with a weak mercuric chloride lotion about an hour before the operation, but the surgeon in the theatre will also require a saturated solution of boric acid and any other lotion of his choice.

Except in the case of glaucoma, correction of squint and major operations such as the removal of the eye, a local anaesthetic is used, generally in the form of 2 per cent cocaine drops, sterile solution. Beginning about half an hour before the operation, one drop is put into the affected eye and this is repeated every 5 minutes. Occasionally it is necessary to desensitize the sound eye also, in order to make sure of perfect immobility. This, together with an instillation of a drop or two of 1 in 1,000 adrenalin, is the usual practice in cataract operations. In the theatre the nurse will have ready the special instruments required, these as a general rule being those shown and described in the illustrations.

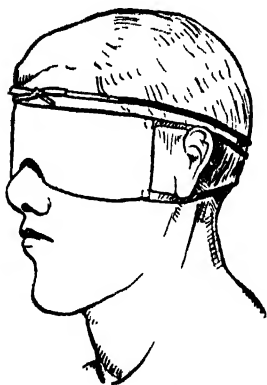


FIG. 73.—MOORFIELD'S BANDAGE.

After-treatment of eye cases must be characterized by perfect quietude. In the case of cataract, for instance, it is better to have the patient nursed alone and in a darkened room, and talking is prohibited, since the slightest movement of the facial muscles might upset the delicate work done. Both eyes are bandaged, the best type of dressing being circular pads of gauze covered with light cotton wool, the whole being kept in position by a special type of bandage (see Fig. 73) known as the "Moorfield's Bandage." When patients are operated on in the morning, they usually have pain and headache by evening, and they may require a salicylate powder, aspirin or even a stronger hypnotic at night. The patient should be impressed with the necessity of avoidance of coughing, sneezing or other movements of the head. The head is kept low and the knees are supported by a pillow; every possible effort should be made to



FIG. 74.—GRADDY'S TRACHOMA FORCEPS.



FIG. 75.—SNELLEN'S ENTROPION FORCEPS.

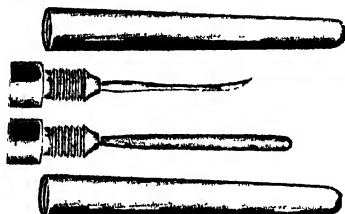


FIG. 76.—EYE NEEDLE AND SPUD IN SCREW CASES.



FIG. 77.—GRAEFE'S FIXATION FORCEPS.

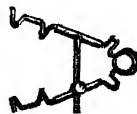


FIG. 78.—EYELID RETRACTOR.

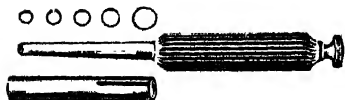


FIG. 79.—STEPHENSON'S TREPHINE.

(By courtesy of the Surgical Manufacturing Co., Ltd., London.)

prevent strain. Although the eyes may be safely protected by the bandage, it is wise to tie the wrists to the edges of the mattress, lest the patient rub his eyes whilst asleep.

In many cases old people are kept in bed for 3 days only, and the upright position is established as soon as possible owing to danger of hypostatic pneumonia. If possible, in cataract the recumbent position should be maintained for a week. Fluid diet is necessary only for 24 to 36 hours. By the 3rd day, when a purge is given, full diet should have been established. The dressings are regulated as follows. After 24 hours the eye is inspected, the surgeon usually doing the first dressing; with scrupulous care the surgeon gently bathes the lids with small eye swabs soaked in weak boric lotion, separates them, inspects the eye with the aid of a torch and leaves in 1 drop of 1 per cent atropine, and 1 drop of ophthalmic penicillin, and this is repeated daily for the next 3 or 4 days. All that is necessary after this is the daily instillation of 1 drop of atropine for the next 3 or 4 days, increased if the iris is inflamed and the pupil in need of dilatation. It is best to keep the sound eye covered until the morning of the 4th day, and the affected eye should not be uncovered until the 8th to 10th day. Smoked glasses should be worn for 6 weeks. In the first week if the patient be allowed up, he must move slowly and with great care; naturally the nurse must lead him.

The above remarks apply to cataract, but with modification may be regarded as applicable also to most of the other operations on the eye except strabismus, which is described below.

The complications to be avoided are generally the result of internal strain and include hernia of the vitreous humour, prolapse of the iris and intraocular haemorrhage causing dislocation of the various elements. All of these conditions are very serious. It must always be remembered that for various reasons there is a danger of what is known as sympathetic ophthalmia, to avoid which cortisone eyedrops are instilled into the affected eye. Should the condition develop in spite of this treatment, ACTH is given systemically: when one eye is affected the other may assume the same condition, the worst state of affairs occurring when generalized and rapid sepsis of the eyeball (panophthalmitis) makes removal of the eye urgent. Senile patients may be "heady" for the first 2 days, but the delirium is not marked.

Strabismus.—Squint or strabismus may be due to inherited tendency towards loss of perfect coordination of the eye muscles; this leads to over-development and excessive action of one group, with weakness and loss of action of another. Squint may also be caused by paralysis of one of the muscles, the resultant position of the eye giving a clue to the muscle affected; double vision or diplopia occurs. In most cases the former condition is found, young children developing an internal strabismus more or less

suddenly in association with faulty refraction. Such cases may be dealt with by strong corrective lenses and nowadays the sound eye is completely covered with an "Elastoplast" shade for a considerable time followed by special exercises under the supervision of trained orthoptists which aim at establishing coordinated vision. If this treatment should fail it may ultimately be found necessary to perform the operation of tenotomy. For this operation a general anaesthetic may be necessary in the case of an excitable child. The surgeon either cuts the powerful tendon, or shortens the long tendon; he may also advance the long tendon as an alternative to shortening. In any case he leaves the muscles in perfect harmony and restores the eye to normal appearance, generally to the great relief of both patient and parent.

The preparatory treatment for strabismus operations is much the same as for other eye operations. The after-treatment consists of perfect rest for 3 or 4 days with both eyes covered. After the stitches have been removed (8 to 10 days) the patient is gradually accustomed to the new conditions; very often glasses are prescribed when the condition has completely settled down.

In all eye conditions, sepsis is a danger but a review of the situation shows how little sepsis actually occurs; it is wonderful to observe the speed with which the cornea and the other structures recover.

Refractive Errors.—When the vision is perfect for both near sight and distance, and when therefore the rays are universally focused on the sensitive point at the back of the posterior chamber, we say that the condition is one of emmetropia. When old age comes on, the vision is affected for near objects, the patient holding his book as far away from him as possible, generally at arm's length; the condition is called presbyopia, or "the sight of the old man," but as a matter of fact it comes on at about the age of 45 in those who have previously enjoyed normal sight.

The 3 defects of vision that commonly require correction are hypermetropia (long sight or inability to see near objects clearly), myopia (short sight or inability to see distant objects clearly), and astigmatism, a defect in the curvature of the eye in one or both planes. The last may affect both myopic and hypermetropic persons or it may occur in the "pure" state. By placing a convex lens in front of the eye, we can adjust the rays so that they are accurately focused on the retina of hypermetropics, who have a short eye, and similarly the concave lens makes the adjustment in myopics, who have a long eye, but very refined corrections must be added for astigmatism, which although very slight may cause severe headache, watering of the eye and depression, especially after long strain. Test types and figures of fixed size are used (Snellen's); these are familiar sights on the walls of oculists' rooms.

AFFECTIONS OF THE EAR, NOSE AND THROAT

THE EAR. HOW THE EAR IS EXAMINED. OTITIS MEDIA. MASTOID DISEASE. THE NOSE. NASAL EXAMINATION. INSTRUMENTS REQUIRED. EPISTAXIS. FOREIGN BODIES. RHINITIS. POLYPUS. SINUS DISEASE. DEFLECTED SEPTUM. INSTRUMENTS FOR NASAL OPERATIONS. THE THROAT. EXAMINATION OF THE THROAT. ACUTE TONSILLITIS. CHRONIC TONSILLITIS. ADENOIDS. REMOVAL OF TONSILS AND ADENOIDS. CLEFT PALATE AND HARELIP. TRACHEOTOMY. INTUBATION. LARYNGEAL SURGERY.

MAINLY on account of tradition but also because of propinquity and close relationship of the structures concerned, the diseases of the ear, the nose and the throat are generally grouped together and are regarded as a single field of specialism nowadays referred to as otorhinolaryngology. Nevertheless the 3 divisions are distinct and thus according to custom each is dealt with separately in this chapter.

The Ear

It is assumed that the nurse will have revised the anatomy and physiology of the regions concerned, and that information already given in various places in this work with regard to treatment of the ear will be fresh in the memory.

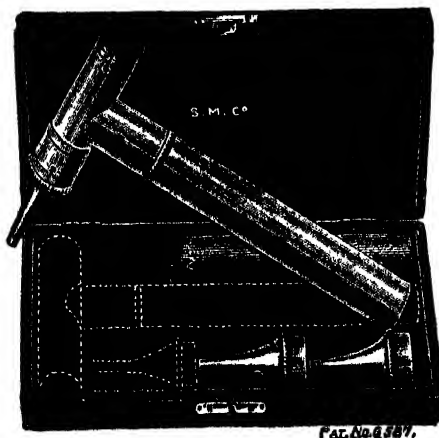


FIG. 80.—ELECTRICAL AURISCOPE.

(By courtesy of the Surgical Manufacturing Co., Ltd., London.)

How the Ear is Examined.—It has already been stressed that the tympanic membrane is not only highly sensitive but is also very easily injured, therefore the

internal examination is invariably done by a doctor, who passes an aural speculum electrically illuminated (see Fig. 80) into the canal until the end of the speculum, which varies in diameter according to the individual, is close to the drum of the ear. The whole surface can then be studied. In some cases, the older method of using the speculum with the light reflected from a standard lamp into it by means of a strong reflecting mirror fixed to the examiner's forehead is preferred.

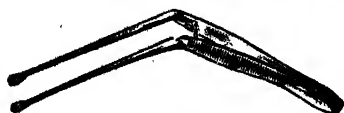


FIG. 81.—POLITZER'S AURAL FORCEPS.
(By courtesy of the Surgical Manufacturing Co., Ltd., London.)

The surgeon may find that the canal is blocked by a plug of hard wax; this is one of the common causes of deafness and results from the accumulation of dust and moisture in the canal. The surgeon may remove the wax, using special long angular aural forceps (Fig. 81), but as a rule the plug is softened by almond oil or olive oil for a day or two, after which the wax may be dislodged by the method described in Vol. III, p. 22. The surgeon may wish to test the nerve or bone conduction and thus assess any deafness that may exist; for this purpose he requires to use a specially loud ticking watch and a set of tuning forks (Fig. 82).



FIG. 82.—TUNING FORK.

(By courtesy of the Surgical Manufacturing Co., Ltd., London.)

It may be that there is eustachian catarrh, the small pharyngotympanic tube leading from the throat to the middle ear being choked with mucus and giving rise to the well-known sense of discomfort and muffled hearing. The patient may be instructed how to clear this himself; he is told to close both nostrils with his fingers and to puff out his cheeks forcibly, the mouth being kept tightly shut. The effect is to drive air into the middle ear, and so to clear the tube, but when the catarrh is marked the air cannot pass through and certain signs are found. Generally, however, the surgeon uses Politzer's bag (Fig. 83). First the patient is given a teaspoonful of water and told to keep it in the closed mouth.



FIG. 83.—POLITZER'S BAG.
(By courtesy of the Surgical Manufacturing Co., Ltd., London.)

The nasal end of the bag is then pushed up one nostril for about half an inch, the other nostril being kept closed by the finger. The patient is told to swallow; at the same time the surgeon compresses the bag and thus sends a column of air through the pharyngotympanic tube. The patient generally experiences immediate relief, being aware of a short hissing sound passing into the cavity. The surgeon, however,

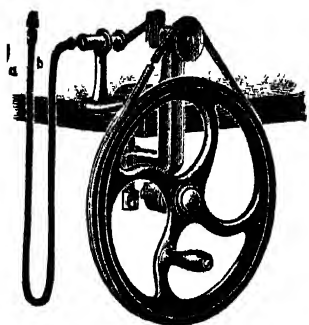


FIG. 85.—NOEBEL'S ROTARY MASSEUR.



FIG. 84.—TOYNBEE'S AUSCULTATION TUBE.

FIG. 86.—PEGLER'S AURAL PROBE.

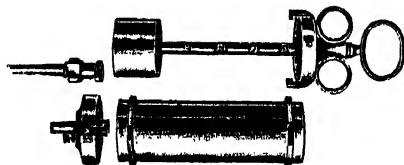


FIG. 87.—ALL-METAL AURAL SYRINGE.

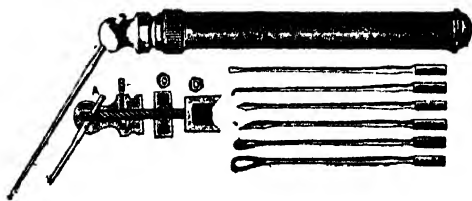


FIG. 88.—SPAGUE'S POCKET SET OF AURAL INSTRUMENTS.

(By courtesy of the Surgical Manufacturing Co., Ltd., London.)

must make his own observations; a rubber diagnostic tube, with ear pieces at either end, connects the ear of the patient and the ear of the surgeon. When the hissing is absent or faint, the column of air is obviously obstructed; when there is bubbling, moist catarrh is present and when the air passes with a loud rush it may mean that the drum is perforated. The surgeon may prefer to pass the eustachian catheter (Fig. 89) into the tube.



FIG. 89.—HOVELL'S EUSTACHIAN CATHETER.
(By courtesy of the Surgical Manufacturing Co., Ltd., London.)

This requires practice and skill, the tip of the catheter being passed up the nostril and turned into the tube, then directed up the narrow passage for a short distance. When the other end of the catheter is connected to the tip of the Politzer bag air can be pumped in direct.

The surgeon may have to remove foreign bodies such as beads, seeds, or gravel from the ear. The only other external diseases are eczema, dealt with in the usual way, or furunculosis of one of the follicles of the external meatus, this causing great pain and irritation; in the latter case soothing ointments, application of heat and sometimes incision soon clear up the condition. Within recent years sulphonamides and penicillin have been successfully used. Apart from otitis media, described below, the drum of the ear may be perforated by explosions, fractures of the skull or violence. A simple aseptic ribbon gauze dressing is all that is necessary.

When there is a perforation of the drum from any cause, it is generally bad practice to syringe out the ear. A warning has already been given about the dangers of using the syringe unless under doctor's orders.

Otitis Media.—Inflammation of the middle ear is the commonest disease of the region under consideration. It is often a sequel to measles or scarlet fever but it may be the result of a cold in the head or of catarrh of the various channels and spaces near the ear. Various organisms have been discovered as the cause, these including the diphtheria bacillus, the influenza organism, the typhoid bacillus, T.B. and so on.

Signs.—There are all grades, from the common and transient earache to the dangerous spreading sepsis ending in mastoid abscess. In many cases the drum bulges and if the pus does not burst through, the operation of paracentesis of the drum may be indicated. This requires skill, gentleness and speed. A well-established case of otitis media shows evidence of pain and

tenderness round the ear, and until the drum is perforated there is ever-increasing agony for the patient. There may also be noises in the head, dizziness and slight delirium. When the condition clears up quickly the temperature drops and the discharge rapidly dries up under efficient treatment. The dramatic change after perforation is most impressive; it is akin to the crisis in pneumonia.

After the ear overcomes its acute inflammatory state it may take a long time to heal up, and through the "window" of the tympanic membrane there flows a steady discharge of pus of variable fluidity. These discharges are most offensive and may go on for weeks or months, the condition being known as chronic suppuration of the middle ear (C.S.M.E.) or otorrhoea.

Treatment of Otorrhoea.—The danger to neighbouring structures being obvious, every effort should be made to stop the discharge and to allow the drum to heal up. Among the poorer classes, however, the "running ear" is regarded more as a nuisance than as a disease and thus many children become extremely debilitated, the infection spreads and we find complications such as facial paralysis, thrombosis of the adjacent transverse sinus, cerebral or cerebellar abscess and, above all, mastoiditis. These may also supervene on an acute attack. Polypi, erosion of bone, non-healing of the perforation, partial deafness and exuberant granulations may complicate resolution. Each of these requires prompt and effective surgical treatment, but so far as the nurse is concerned the routine of treatment for otorrhoea will suffice as a typical example of the methods in use.

To begin with, conservative methods may be tried, and they are generally successful if they are persevered with. Frequent mopping of the ear with sterile wool attached to a fine wooden probe, so that the ear is kept perfectly clean, is essential. It may be necessary to do this every 20 minutes, instil spirit and flavine drops, or in simple perforation a pack of spirit and flavine, in addition to the systemic administration of antibiotics and general improvement of personal and environmental hygiene being employed.

The practice of insufflating the canal with sulphanilamide powder, so popular a few years ago, has been abandoned as it produces photo-sensitivity of the skin in many patients thus treated, a distressing condition which so far has defeated all the efforts of dermatologists to effect a cure. The operation of radical mastoidectomy is only rarely performed, and that usually in neglected cases.

Mastoid Disease.—This may be an immediate complication of acute otitis media or it may result from chronic discharge. In children the mastoid process, so prominent and so easily felt at the back of the ear, consists of a bony chamber forming a sor

of anteroom to the middle ear, but in adults various cells form and open into a space known as the mastoid antrum, the latter in turn communicating with the middle ear by a tiny passage called the aditus. The antrum is very close to the transverse sinus, and it is obvious that there are great dangers of septic spread.

Signs.—When the mastoid becomes involved, the pain centres on the bone just behind the ear. The surface of the skin becomes red, oedematous and tender; there is rise of temperature—perhaps rigors—and unless prompt measures are taken, evidences of cerebral and intracranial involvement such as delirium, irritability, restlessness and vomiting are produced. The affected ear clearly sticks out more than its fellow.

Treatment.—The treatment of mastoid inflammation has been revolutionized by the advent of the sulphonamides and penicillin; only occasionally has surgical treatment to be resorted to. In the event of operation in children a simple incision may be sufficient, this being followed by drainage for a few weeks until the sepsis is cleared up.

In older patients, and after long-continued chronic discharge with evidence of permanent damage, the more radical operations must be considered.

1. *Schwartz's Operation.*—In Schwartz's operation, the skin, periosteum and other structures over the bone are raised, and with a gouge the bone is nibbled until the antrum is exposed. The antrum is then scraped out and packed with sterile gauze, and a small rubber drainage tube is left in through which the wound is irrigated at regular intervals with penicillin. The wound granulates from the bottom and ultimately heals.

2. *Radical Operation.*—As its name implies, this operation is performed in order to make an entire clearance of a septic area and is generally done after chronic mastoiditis. The antrum is cleared, a part of the bony external auditory canal is taken away and a clear view is obtained of the middle ear, from which also two ossicles are removed, the stapes being left as a plug in the fenestra ovalis. A Thiersch graft is applied at the conclusion of the operation. A single cavity is thus formed, care being always taken not to damage the facial nerve in its bony canal. The dressings are applied through the external auditory meatus, the wound behind being simply dressed for about 10 days.

3. *Modified Radical Operation.*—The tympanic membrane and the ossicles are not removed; drainage goes on through the external auditory meatus. The antrum is thus made an annexe of the middle ear by taking away the meatal wall, as above.

Pre-operative and Post-operative Treatment.—To prepare a patient for any of the above operations, the area round the ear on the head is shaved for 2 to 3 inches and the skin dealt with the day



FIG. 90.—AURAL CURETTE (QUERS' PATTERN).

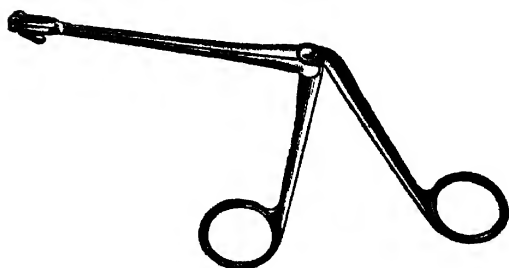


FIG. 91.—OSTROM'S BACKWARD CUTTING PUNCH FORCEPS.

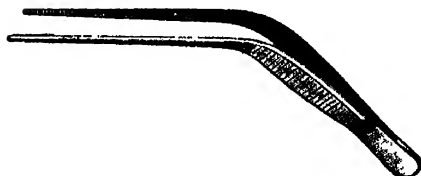


FIG. 92.—WILDE'S AURAL FORCEPS.

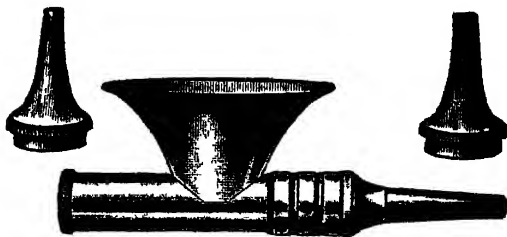


FIG. 93.—BRUNTON'S AURISCOPE.
(By courtesy of the Surgical Manufacturing Co., Ltd., London.)

before in the usual way, a preparatory dressing being left on. The canal is cleansed with peroxide of hydrogen, and a plug of gauze is left in, this being soaked in boric acid solution and replaced by a dry gauze plug just before operation. In the theatre the following instruments must be ready (see illustration): aural specula and lamp, mallet, gouge, probes, Stacke's protector, periosteum elevator, dissecting forceps, scalpels, retractor, bone forceps, fine curettes.

The first dressing is done under anaesthetic, when the sutures are removed, 7 to 8 days after operation, and subsequently the treatment should comprise dressings done every day. When the discharge increases, the drainage may be changed daily, care being taken that the granulations are not disturbed unless they are too exuberant.

Complications.—The main complications of otitis media and of mastoid disease are dangerous and must be avoided if possible. They are transverse sinus thrombosis, abscess of the brain, abscess between the skull and dura mater and meningitis, these giving rise to various signs of cerebral irritability, rigors, delirium, coma and severe headache, with marked evidences of toxæmia.

The Nose

The anatomy and physiology of the nose are described in Vol. I, pp. 45, 107 and 282, and the methods of irrigation are dealt with in Vol. III, pp. 21 and 22.

Nasal Examination.—The surgeon may examine the nose from the front (anterior rhinoscopy) or from the back (posterior rhinoscopy); in both cases he sits in front of the patient. In the former case, he uses a special nasal dilating speculum (Fig. 94), and by placing a strong electric lamp on a standard behind the patient's left shoulder, sends a beam of light from a head mirror; special electrical headlamps are also in common use. In the case of posterior rhinoscopy, the best instrument is a specially illuminated magnifying mirror, set at an angle to the stem, and similar to those used by dentists. In looking at the interior of the nose from the front the nurse must remember that the middle partition, or septum, is smooth and normally straight but that the outer wall of each nostril is roughened and irregular owing to the nasal conchæ. The whole interior of the nose is very complicated; it resembles a honey-



FIG. 94.—NASAL SPECULUM
(THUDICUN'S PATTERN).
(By courtesy of the Surgical Manufacturing
Co., Ltd., London.)

comb, being full of partitions, channels, chambers, sinuses and shelves of bone. The nurse would do well to revise the anatomy of this region, especially of the accessory sinuses of the nose (frontal, sphenoidal, maxillary and ethmoidal), since these often become affected by nasal disease, especially catarrh. It should be remembered that the roof of the nose is formed of the thin cribriform plate of the ethmoid bone, above which lies the brain.

The lining of the nares is very useful. The lower two-thirds of the septum, along with the conchae, is specialized for warming and filtering the air passing through to the lungs. The upper

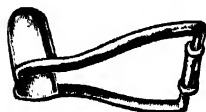


FIG. 95.—LENNOX BROWNE'S NASAL SPECULUM.

(By courtesy of the Surgical Manufacturing Co., Ltd., London.)

third of the septum is the olfactory area, rather less active in the human being than in the animal. In the condition of inflammation of the lower nasal cavity called coryza (or more popularly a "cold in the head"), the mucous membrane is thickened, discharge occurs and the air passages are obstructed; breathing therefore occurs through the mouth for a day or two. In anterior rhinoscopy, the silver probe is used to investigate the lower and middle turbinate areas; usually a 2 per cent solution of cocaine is applied by means of a small pledget of cotton wool secured to the end of the probe and soaked in the lotion; by this means the membrane is shrunk. In posterior rhinoscopy a warmed mirror is used and it is passed back through the mouth without touching the tongue, the patient keeping the mouth wide open until the posterior nares are in view; any adenoid overgrowth which is seen can be confirmed by passing the forefinger backwards and making a digital examination after the mirror has been withdrawn.

Instruments Required.—For the examination of the nose the nurse should put out the instruments and appliances as shown in these pages. We may include probe, cotton wool, cocaine, spirit lamp, specula, tongue depressor, mirrors, forceps, head mirror if necessary, nasal sprays, insufflator. It should be ascertained beforehand that the electrical connections, lamps and other lighting arrangements are in good working order.

Epistaxis.—Bleeding from the nose has already been mentioned in Vol. I, p. 317; if the first-aid methods fail it may be necessary to plug the nostrils with ribbon gauze soaked in adrenalin or to cauterize the vessels which are torn. When epistaxis occurs the nurse should think of the following possible causes: high blood pressure, cardiac, liver or renal disease, nasal polypus, chronic ulceration (perhaps as a sequel to operation), haemophilia, vicarious menstruation, local injury, fracture of the

cribriform plate and the ordinary sudden blow on the nose from a person's fist.

Foreign Bodies.—Foreign bodies of various kinds may be pushed up the nostril and they give rise to a discharge of pus, therefore if this is found to persist for a day or two an effort should be made to dislodge the slate pencil, or button or bead, or whatever it may be, by flushing out the sound nostril while the patient keeps his mouth wide open; the returning fluid passes down the affected nostril and washes out the foreign body. If this manoeuvre is unsuccessful, a fine wire loop, scoop or forceps may be used, nitrous oxide and oxygen being given as an anaesthetic when necessary.

Rhinitis.—By this term we mean inflammation of the lining of the nose, acute or chronic. The commonest example of acute rhinitis is acute coryza (nasal catarrh or "cold in the head"). As already stated, this affects the lower anterior nares, and runs its course until the individual has developed local and general resistance to the germ. If cold be recognized in time, it may be aborted by spraying weak formalin solution over the lower nostrils with an atomizer (Fig. 96). It may be prevented by a vaccine. In the fully-developed cold in the head, the accessory sinuses, the pharyngotympanic tube, and other adjacent parts become congested, and we feel "stuffed up" as the saying is; deafness, dull pains in the forehead and above the upper jaw, loss of sense of smell and mouth breathing are typical signs. The remedies for cold in the head are legion and many believe that since the catarrhal stage is, so to speak, the beginning of the end, nothing should be done beyond the removal of the discharge by frequent blowing of the nose and the general constitutional treatment of extra warmth and rest. The simple form of rhinitis must not be confused with the dangerous condition met with in diphtheria, measles and scarlet fever, nor with that which results in those hypersensitive to pollen and dust (hay fever). A purulent rhinitis may also follow an acute rhinitis in weakly children; this requires special irrigation. Finally acute rhinitis, and sometimes chronic rhinitis, may be the result of a deflected septum, enlarged turbinates, polypi or adenoids.

Chronic rhinitis may be found in children suffering from



FIG. 96.—NASAL SPRAY.
(By courtesy of the Surgical Manufacturing Co., Ltd., London.)

adenoids, a feature of which is constant watery discharge from the nose; it may also be caused by certain types of bacterium. As a general rule, however, chronic rhinitis is associated with overgrowth of the inferior nasal concha; after the discharge has gone on for some time, the patient seeks a doctor, who finds that the operation of cauterization or of actual removal of part of the bone may be necessary. Hypertrophic rhinitis, as this disease is called, may thus be cured under local or general anaesthesia. A lubricated plug is left in until the slough separates and is discharged in about 10 days. When there is danger of bleeding, plugs soaked in adrenalin are applied for 48 hours, after which nasal douching is done. Chronic pharyngitis and laryngitis commonly accompany chronic rhinitis.

Polypus.—A nasal polypus usually grows from the middle concha; it has a short stalk and hangs down like a small purple berry; several usually occur together and fill up the middle meatus. Simple removal by snare is not a radical cure, as the origin of the overgrowth is usually in the ethmoidal cells or the maxillary antrum, therefore surgeons generally drain the neighbouring sinuses after removal of the affected middle turbinal body and associated ethmoidal cells.

Sinus Disease.—As a result of coryza, infectious diseases and other ailments the lining of the wall of the maxillary antrum, ethmoidal sinus, frontal sinus or sphenoidal sinus may become inflamed. The proximity of the frontal and ethmoidal sinuses to the brain and of the maxillary antrum to the eye and teeth makes infection easy and very serious. The chief symptoms are increasing dull pressure pain, with fever and copious discharge of muco-pus in the established cases. A simple method of finding out whether or not the maxillary sinus is full of pus is to place a small electric lamp in the patient's mouth in a darkened room. The shadow on the affected side will be very prominent. This procedure is called transillumination. To make certain, the antrum may be punctured. Positive results indicate treatment by lavage and penicillin irrigation, the latter usually being successful only after an opening is made at the anterior end of the lower concha and a space made for the passage of a small catheter. An alternative method is the making of a narrow drainage canal just above the canine tooth in addition to the intranasal opening. The antrum can thus be flushed out from one end to the other, normal saline being used twice daily at first, the irrigations afterwards becoming gradually reduced.

A more dangerous situation exists when the frontal sinus becomes septic; when there is failure of the nasal effluence it may be necessary to open the sinus by an incision just above the eyebrow, the opening being kept patent until the discharge has ceased. The risk of meningitis and brain abscess is great.

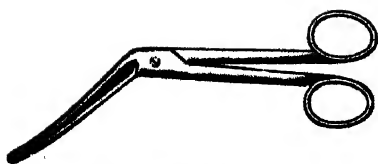


FIG. 97.—BECKMANN'S NASAL SCISSORS.

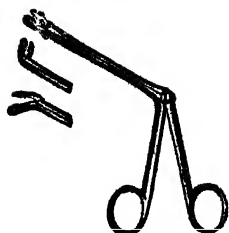


FIG. 98.—GRÜNWALD'S PUNCH FORCEPS.



FIG. 99.—KILLIAN'S SEPTUM KNIFE.



FIG. 100.—WALSHAM'S SEPTUM FORCEPS.

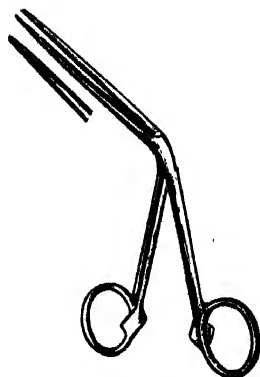


FIG. 101.—HEATH'S NASAL DRESSING FORCEPS.



FIG. 102.—HEATH'S NASAL AND AURAL PROBES.



FIG. 103.—WATSON WILLIAMS'S ANTRUM CANNULA.

(By courtesy of the Surgical Manufacturing Co., Ltd., London.)

Deflected Septum.—The septum may become deviated for various reasons, the net result being narrowing of the nostril and obstruction to breathing. The case is often complicated by enlargement of the middle concha. The operation of submucous resection is frequently done; in this the surgeon dissects back the mucous membrane and excises part of the vomer and cartilage then allows the two mucous membranes to adhere, forming a more elastic fibrous partition. If local anaesthesia is used, cocaine (10 per cent) and adrenalin (1 in 1,000) are applied to the nostrils by cotton wool plug about 30 to 40 minutes before the operation. The interior of the nose is prepared by frequent douching with a mild antiseptic. The surgeon generally leaves in a long thin strip of sterile gauze soaked in soft paraffin and if possible this should not be disturbed for 48 hours. Cold compresses may be applied to the bridge of the nose to ensure that epistaxis does not take place. On the second day it is usually possible to institute nasal douching, preferably by the "sniffing" method described in Vol. III, p. 22.

Instruments for Nasal Operations.—The above description of treatment applies to most nasal operations, and as a general rule the instruments required are as shown in the illustrations.

The Throat

Various points in the anatomy and physiology of the throat, including the nasopharynx, should be referred to by the nurse, especially those mentioned in Vol. I, pp. 186–188, 197 and 198.

The nasopharynx should be regarded as a kind of alcove of the upper part of the pharynx; its floor is the soft palate, which rises like a valve to shut the exits of the posterior nares during the act of swallowing; its roof is the hard palate. In this cavity are certain collections of lymphoid tissue which commonly become overgrown in children, causing the well-known condition of adenoids. Since the tonsils are usually hypertrophied at the same time the two conditions are generally dealt with together as a syndrome (see below).

Examination of the Throat.—When the patient is asked to say the word "Ah," with his mouth wide open, the interior is clearly visible because the uvula rises; a glass spatula may also be used to press the tongue down if necessary. A survey should be made of the teeth (noting any bad ones), of the state of the tongue (furring, ulcers and so on), of the tonsils (noting enlargement, inflammation and white patches) and of the uvula, roof of pharynx and posterior pharyngeal wall (all of which may be red, swollen or dry according to the condition). By using the special circular mirror with long handle, it should be possible to make

out the presence of adenoids or to obtain a view of the larynx, although the nurse is rarely asked to do this. There are various ways of inspecting the throat. In adults the most satisfactory method is to have the patient seated, with his head held well back. The doctor stands in front of him, and either by using the



FIG. 104.—THE BARTON THROAT TORCH, COMPLETE WITH TONGUE DEPRESSOR.

(By courtesy of the Surgical Manufacturing Co., Ltd., London.)

light from a standard lamp, or more simply, the light from a pocket electric torch held by himself or the nurse, he floods the mouth and throat with light and has no difficulty in making his examination. Children may have to be held on the nurse's knee, and the nurse, as is well known, may have to make use of all her limbs as well as her persuasion to keep the child steady, so that the examination may be satisfactory.

Acute Tonsillitis.—Very often this is associated with rheumatism, and should never be neglected (see Vol. III). Three conditions are possible—1. general inflammation, affecting both tonsils as a rule and common in scarlet fever, diphtheria, and throat infections; 2. inflammation of the crypts and lacunae (follicular tonsillitis) in which one or both tonsils become covered with white patches which ultimately prove themselves to be the ends of cheesy-looking plugs which are discharged; 3. peritonsillar abscess or quinsy, a condition affecting one tonsil only and characterized by great swelling, pain, throbbing and fluctuation round one tonsil, relieved by bursting of the abscess or by incision. In all these cases there is usually preliminary debility, irritation, swelling, pain and rise of temperature, with heavy breath, furred tongue, dry mouth and constipation. The temperature may suddenly mount up to 104° F. in severe cases. The neighbouring glands may become affected. All tonsillar lesions should be tested by swabbing for diphtheria. Treatment is constitutional in the first place and follows the usual lines. Secondly sulphonamides may be given by the mouth, as well as warm antiseptic mouthwashes and gargles or penicillin lozenges placed underneath the tongue and allowed to dissolve slowly, 2 or 3 times a day. It may be necessary to apply poultices or other concentrated forms of heat to the neck. Plenty of fluids should be given, preferably through a rubber tube, as swallowing is a great trial. Aspirin is given to counteract the pyrexia. In children especially it is advisable to keep the patient in bed and to treat

the condition as an infectious disease; the nurse, remembering the possibilities of cardiac complications, septicaemia, bronchitis and collapse, must be alive to any negative changes. After a quinsy has been evacuated there is great relief, and the more frequently the patient gargles the throat with a hot phenol or other antiseptic solution the more quickly does the condition clear up.

Chronic Tonsillitis.—If a patient has had several attacks of acute tonsillitis he may develop a condition of chronic tonsillitis, with or without enlargement, and as a general rule such tonsils are best removed as they are a menace to health and form the basis of many infectious processes. The tonsils may also become overgrown (hyperplasia) in children, and this condition is almost invariably associated with the formation of adenoids at the back of the nasal outlet. The condition is described below.

Adenoids.—When the overgrowth of lymphoid tissue at the nasopharynx becomes so marked that undoubted obstruction to breathing is caused, the child presents certain symptoms which are unmistakable, and as they are accounted for partly by enlarged tonsils also the syndrome may be discussed now.

Children between the ages of 4 and 12 are usually affected. The most notable thing is the adenoid facies; the child appears to be narrow in the face; his mouth is continually open, his breathing is heavy, the nose runs steadily, the nostrils are narrow, the teeth usually prominent and there is a dull and lifeless expression about the whole aspect that stamps the patient as undoubtedly handicapped. It is true that such children—owing to their loss of power of nasal breathing and as a result of extra work put on the throat by the altered air current, but also owing to their sensitive feelings—become very depressed, backward, unsociable and the objects of much criticism, but the change to be observed after successful operation is outstanding. Apart from the facial expression, there is an added defect in deafness, while the patient, since he speaks as if he had a severe cold in the head, cannot make himself easily understood. Coughs, colds and general catarrh are easily contracted and the child seems to wilt like a plant requiring water; he snores during the night and his throat is dry in the morning. In time the chest may become flat or deformed. A thick, irritating cough is the rule.

Examination usually proves the presence of adenoids and also that the tonsils are enlarged, sometimes so much that they almost meet in the middle line. Such a state of affairs demands radical cure by operation—removal of adenoids but not usually of the tonsils.

Removal of Tonsils and Adenoids.—For a week or so before the operation, the nose, throat, nasopharynx and teeth should be vigorously cleansed twice daily by mouthwashes and

antiseptics. If possible every septic focus should be eradicated. A general anaesthetic is essential, but since the operation is of very short duration, ethyl chloride or nitrous oxide and oxygen may be used; some surgeons like chloroform and ether. General preparation of the patient must therefore be made as in all major operations.

The child lies on his back on the operating table, his head supported by a pillow; the head should be protected by a towel or rubber bathing cap, as haemorrhage may be widespread. After anaesthesia is established the patient's position is altered; he may be pulled up the table a little so that the shoulders are supported by the pillow or sandbag, and the head hangs backwards over the table, a strong light shining over the mouth. Sometimes the child is placed in the upright position or on his left side. A Ferguson's gag is gently inserted between the jaws and the mouth is opened.

Most surgeons prefer to dissect out the tonsils nowadays, removing them completely, and ligating all bleeding points; the copious haemorrhages, at one time so troublesome, are now almost unknown.

After removing the tonsils, using a special adenoid curette, the surgeon sweeps the instrument over the roof and sides of the nasopharynx and removes the adenoids. The head is then turned on the left side and the face is sponged with plenty of iced water to stop the bleeding; an adrenalin swab may be pressed over the area for a minute.

To remove the tonsils the old-fashioned guillotine may, however, be used. Many modern appliances work on the principle of snaring and twisting the tonsil so that it is quickly enucleated with very little haemorrhage.

After the patient has been put back to bed, he is kept on his left side so that blood and mucus will have ample outlet from the corner of the mouth. There are various opinions about the post-operative treatment of tonsillitis. It is becoming more and more realized that it is detrimental to the patient to send him home from the outpatient department once he has recovered from the anaesthetic, and many stress the need of keeping the patient in bed for a day or two, with confinement to the ward or sickroom for a week.

The dangers of haemorrhage and sepsis must ever be kept in mind. Gargles should be provided, and cold drinks *ad lib.*; to the great joy of all youthful patients it has been decreed that ice-cream is a suitable form of nourishment. Fluids may be provided for the first 48 hours, but gradually light and ordinary diets are established. The great point to remember about tonsil and adenoid removal, however, is that the operations are useless unless the child is re-educated in nose breathing. This should be



FIG. 105.—WILDE'S POLYPUS
SNARE.

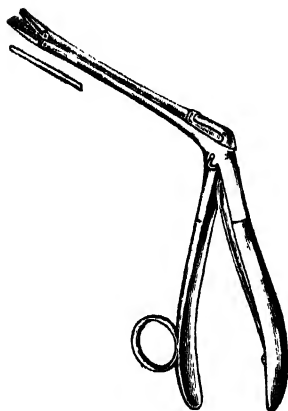


FIG 107.—HAJEK'S PUNCH
FORCEPS.



FIG. 106.—FOSTER
BALLENGER'S PUNCH
FORCEPS.

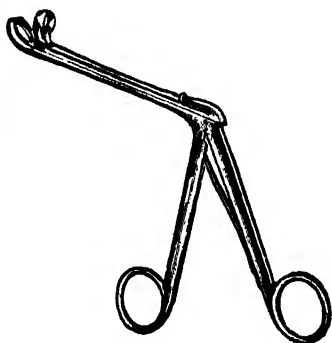


FIG. 108.—TONSIL PUNCH FORCEPS
(STRUYCKEN'S).



FIG. 109.—BOSWORTH'S SAWS FOR CUTTING
UPWARDS OR DOWNWARDS.

(By courtesy of the Surgical Manufacturing Co., Ltd., London.)

a routine part of the treatment, carried out 3 times a day, as the child lies on his back in bed with his mouth tightly closed and practises deep breathing for 15 to 20 minutes. It may be necessary to apply a simple jaw bandage at night.

Cleft Palate and Harelip.—These conditions are closely associated, and often occur together as a congenital deformity, therefore their treatment may be dealt with at this point.

Harelip may be on one or both sides, and the cleft may extend into the nostril, as shown in Fig. 110. The defect should be remedied as early as possible—at least within the first 6 months of the infant's life—and the child should be accustomed to spoon feeding beforehand. The surgeon freshens the two sides of the cleft and carefully sutures them together. The after-treatment consists of prevention of interference by the child with his hands, which should be carefully tied. Feeding may be by tube or by special feeding-spoon. Generally the wound is varnished over and strands of cotton wool are included so that the dressing need not be touched for 3 days, when the first stitches are removed. Great care should be taken that the mouth is irrigated frequently. After



FIG. 110.—HARELIP.

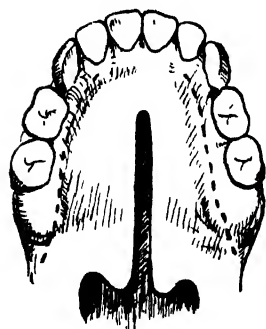


FIG. 111.—CLEFT PALATE.

The dotted lines on either side indicate the site of the incisions prior to suture of the cleft.

a week or 10 days the child may be put to the breast, since all the stitches have probably been removed.

Cleft Palate.—In this condition the floor of the nose is opened by a slit which appears as a cleft in the roof of the mouth of varying extent. Thus the harelip may be continuous with a split alveolus and the hard and soft palate divided completely. The soft palate alone, including the uvula, may be affected or the posterior part of the hard palate with soft palate. The defect gives rise to the well-known difficulty in speech; all consonants are difficult and the explosive sounds pass through the nostrils. The only remedy is suture of the soft palate and often failures have to be recorded. A cleft palate should be dealt with when the child is about 3 years old. Incisions are made close to the line of the teeth on either side of the roof of the mouth (see Fig. 111). The edges of the cleft are freshened and sutured with silk,

silver or horsehair. The gaping lateral incisions are left to heal by granulation. The after-treatment consists in feeding by spoon or by rubber tube; the patient should be kept as quiet as possible. Frequent irrigation of the mouth, and fluid diet for 2 or 3 weeks are essential to success. Re-education in



FIG. 112.—TRACHEOTOMY SET.

(By courtesy of the Surgical Manufacturing Co., Ltd., London.)

breathing may be required; and later on, special education in speech will be essential, particularly when the soft palate has been involved. Care must be taken that the stitches do not become swallowed when they slough out; they are often removed by the surgeon. When all fails a special plate is fitted (obturator) which partially remedies the defect.

Tracheotomy.—The need for tracheotomy in diphtheria has already been mentioned. But tracheotomy may also be indicated when there is spasm of the glottis, oedema of the larynx or obstruction by a foreign body; as a permanency in cancer, tuberculosis, or syphilis of the larynx, the tracheotomy opening may be the only hope of air inlet. Before doing certain complicated operations on the mouth surgeons may perform a tracheotomy for safety's sake.

Very rapid preparation may be necessary and sometimes there is no time for an anaesthetic, local or general. The high or low

operation may be done (i.e. the incision may be made above or below the isthmus of the thyroid gland), but the high operation is the most popular. The patient is laid on his back, with the shoulders supported by a sandbag and the front of the neck on the stretch. The instruments required are shown in Fig. 112. There are various kinds of tracheotomy tubes (e.g. Parker's, Durham's, Cubley's), but all are made on the principle of one inner tube, longer than the outer, fitting into an outer tube which is fitted with a wide flange to keep it in position. The inner tube can thus be removed frequently for cleansing purposes. In doing the operation the surgeon incises the trachea from below upwards at a point just below the cricoid cartilage. Coughing and spluttering of the child in diphtheria cases must be anticipated and nurses must be alive to the dangers. The interior of the trachea may be cleared of mucus by probe or a feather, or by suction, then the outer tube is quickly fitted in position and the inner adjusted. Tapes are firmly tied round the neck to keep the outer tube in position.

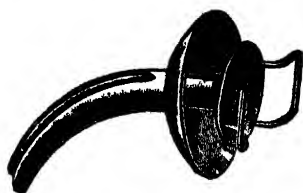


FIG. 113.—TRACHEA CANNULA (FULLER'S).

(By courtesy of the Surgical Manufacturing Co., Ltd., London.)

After-treatment consists in keeping the patient very quiet, a few squares of gauze being left over the tube. The nurse is usually a special one for the case alone. She must see that breathing is good, that the tube is kept clear and that all matter coughed up is collected and burned. The old-fashioned method of nursing tracheotomy cases in a steam tent is slowly passing out of favour, but may be necessary if acute inflammation, e.g. tracheitis or bronchitis, is present.

Feeding should be by fluids, chiefly milk and beef tea, with brandy added if necessary. Rectal or nasal feeding must be resorted to if there be any difficulty in swallowing.

Two complete tracheotomy tubes of the same size are required: i.e. inner and outer tubes and pilot. The outer tube is changed daily, usually by the house surgeon, and the inner tube up to every 20 minutes; for this two or more pairs of dissecting forceps must be ready. Steadying the outer tube with one hand, the nurse withdraws the inner tube and immediately puts in the spare inner tube, which is kept sterilized for this emergency. The tube removed is cleaned by passing through it lengths of $\frac{1}{4}$ inch ribbon gauze soaked in sodium bicarbonate solution, by means of fine sinus forceps or a bent probe. It is then boiled and placed in a sterile covered receptacle ready for use.

The two tubes may slip out completely; this would allow the

wound to close and make death from asphyxiation possible, but in every case of tracheotomy operation the nurse should never be far away from her patient. She is specially detailed to give all her attention to him and should keep a very close watch all the time she is on duty. In the unlikely event of asphyxiation, the result of forcing out of both tubes as above, the nurse should restrain the movements of the child as best she can, then attempt

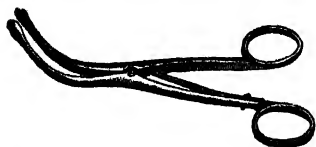


FIG. 114.—BOWLEY'S TRACHEAL DILATING FORCEPS.

(By courtesy of the Surgical Manufacturing Co., Ltd., London.)

to widen the opening with a tracheal dilator, which should be handy (see Fig. 114). Keeping the dilators in position, she should try to apply regular pressure on the lower part of the thorax in an endeavour to restart the respiration. Less serious dyspnoea may occur from blocking of the tubes, which may be cleared as described

above. Needless to say, in all such emergencies the doctor must be sent for at once. Most tracheotomy cases recover the normal breathing after a week. This is tested by placing a finger over the outlet of the tubes for a second or two; when the larynx is clear, the patient breathes through the nose. The wound rapidly heals after removal of the tubes.

Intubation.—This operation is done in some cases as a substitute for tracheotomy. The apparatus required is that of O'Dwyer (Fig. 115). It involves a simple placing of a metal tube in the larynx so that it is impossible to occlude the passage. The child is securely held by the nurse in the sitting position. In skilled hands the operation of intubation may be performed in a few seconds. Having chosen a suitable tube of appropriate gauge and length, the surgeon passes the tube into the larynx with a special introducer. The tube has a flange at its upper end, so that it cannot slip down, but in addition there is a small hole on the flange through which is threaded about 18 inches of strong silk thread, the latter being brought out at the side of the mouth and fixed by strapping over the ramus of the lower jaw. The obturator, which acts like a trocar, is pulled out by special extractors as soon as the tube is in position. After-treatment follows the same lines as that of tracheotomy except that the child should lie on the side of the face which does not hold the strapping and that nasal feeding is usually necessary. The arms should be splinted with light cardboard splints, otherwise the child will quickly remove the tube. The tube can be removed by pulling on the thread.

Laryngeal Surgery.—Most of the affections of the larynx have been mentioned already, especially in Vol. III. In severe malignant disease of the larynx, thyrotomy (opening of the

larynx) may be needed. Very strict pre-operation disinfection of the mouth should be done for several days. Tracheotomy is first performed, then the larynx is opened, the growth removed and the larynx closed again. The after-treatment consists in putting the patient in Fowler's position, sips of water being

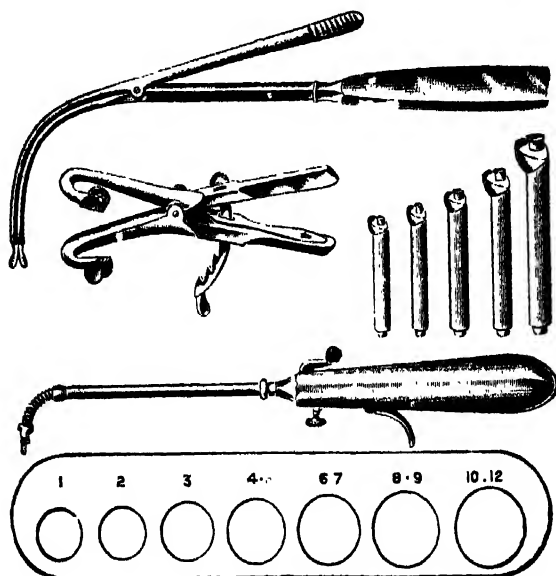


FIG. 115.—O'DWYER'S INTUBATION SET (FOR CHILDREN).
(By courtesy of the Surgical Manufacturing Co., Ltd., London.)

offered 12 hours after the operation. Rectal saline may be given for excessive thirst, but it is common practice nowadays to feed the patient by nasal tube for 3 or 4 days. The tracheotomy tube may be dispensed with after the first day. Complete rest is essential for the patient; talking is forbidden for the first week or longer, during which the patient should be told to use the small handbell at his bedside and to write down his wants in a book provided for the purpose. After about 10 days whispering may be allowed. Full volume of the voice should be sanctioned only after it is certain that the larynx is able to stand the strain. Laryngectomy (removal of the larynx) is done in very extensive cancer, a permanent tracheotomy being necessary.

SECTION XI

GYNAECOLOGY AND GYNAECOLOGICAL NURSING

CHAPTER I

DISEASES OF THE FEMALE REPRODUCTIVE ORGANS

DISORDERS OF MENSTRUATION. AMENORRHOEA. MENORRHAGIA. METRORRHAGIA. DYSMENORRHOEA. THE MENOPAUSE. VAGINAL DISCHARGES. LEUCORRHOEA. INFLAMMATION OF GENITAL TRACT. OVARITIS. SALPINGITIS. ENDOMETRITIS. VAGINITIS. DISPLACEMENTS. PROLAPSE OF THE OVARY. DISPLACEMENTS OF THE UTERUS. NEOPLASMS OF OVARIES AND UTERUS. OVARIAN CYST. OVARIAN SOLID TUMOURS. FIBROIDS. CANCER OF THE UTERUS.

GYNAECOLOGY is the science of the various diseases which affect the female reproductive organs. For a description of the structure and function of the ovaries, uterine tubes, uterus, vagina and other organs of the lower female pelvic region, nurses are referred to Vol. I, pp. 286-291. It is recommended also that revision should be made of the physiology of the female sex hormones. (See Vol. I, pp. 241, 242, 295.)

Disorders of Menstruation

At about the age of 14, sometimes earlier in warm climates, every girl reaches womanhood. This is the time of puberty, when sexual organs lose their infantile properties and become possessed of the complete function of reproduction. Many other developments take place elsewhere, such as the enlargement of the breasts, the deposition of fat in certain parts, the growth of axillary and pubic hair and so on; these changes are brought about by the activities of the ovarian hormones. But the most outstanding change is the initiation of the process of ovulation and menstruation. We have noted already how the graafian follicles rupture on the surface of the ovary and how the ova descend to the uterine tubes, where one may or may not be fertilized by a spermatozoon. It is certain that many unfertilized ova pass to the uterus in the

process of ovulation. The uterine mucous membrane, or endometrium, is an ideal culture-bed for early growth, and when a fertilized ovum descends to the fundus of the uterus it has a very good chance of becoming embedded there and of developing into a new being. The monthly shedding of the endometrium, however, appears to clear the field at intervals and thus, immediately after menstruation, there is formed a new lining to the womb, a fresh and active medium for any ovum which may have become fertilized.

Menstruation is certainly associated with ovulation, but we need not concern ourselves with theories at this point. If we understand that the monthly period ("unwell time," *catamenia*, *menses*, or whatever term may be applied to describe this epoch) is characterized by a gradual increase of the endometrium, so that it is congested, thickened, thrown into folds and virtually ready to burst into the uterine cavity (which it frequently fills) and that for 3 or 4 days in every 28 days the epithelium, with debris and blood from the exposed vessels, is cast off in patches until it is cleared, it is easy to imagine that in women between 14 and 45 there is an ever-changing cycle going on in the womb. This amounts to a "ripening" of the endometrium, a casting-off, and a gradual development of a new lining which in turn matures and is cast off after 28 days, more or less, according to individual constitution. It is very difficult to give the exact data with regard to the normal period, but as a general rule, the first day of menstruation occurs 28 days after the first day of the previous menstruation; the discharge persists for 3 to 6 days (commonly 4 days) and the amount of blood lost is anything from 4 to 8 oz. Normal menstruation is usually accompanied by a sense of pressure in the pelvis, by headache, fatigue, pain in the back, some times sickness and a tension in the breasts which occasionally amounts to a pain. Once the flow is established, however, these symptoms pass off; in normal menstruation, there is little or no discomfort after the first day, and many do not experience anything beyond hygienic inconvenience. As soon as pregnancy is established menstruation ceases and it is not re-established until after the child is born; very often it does not recur until the nursing mother has ceased to feed her child at the breast. As might be expected, there are various abnormalities of menstruation; these are dealt with below.

Amenorrhoea.—Amenorrhoea, or cessation of the monthly periodic flow, may occur in women who should normally have regular menstruation. The causes are fairly numerous and classification may be made under the two main headings given below.

Constitutional.—In this category are included delayed puberty, pregnancy, lactation, the menopause, anaemia, mental disease

and neurosis, tuberculosis, cardiac disease, acute specific diseases, dipsomania, acute diabetes mellitus and any endocrine disease or disturbance, apart from conditions referred to above, e.g., mal-development of pituitary or thyroid.

Local.—Here may be listed all the local defects, such as congenital absence of the ovaries, uterus or vagina, or any combination of these defects, absence of or deficiency of sex hormones, resulting in non-development of the uterus (infantile uterus) and ovaries, diseases of the ovaries, e.g. bilateral ovarian cyst, surgical removal of uterus and ovaries, or removal of both ovaries, obstruction below the level of the internal os uteri, imperforate hymen.

Treatment.—Much depends upon the cause; sometimes (e.g. in cases of imperforate hymen or of obstruction below the level of the internal os) urgent surgical operation is called for. As a rule the treatment falls into 2 main categories: 1. general; 2. hormone therapy. Under 1. are included rest, good hygiene, dieting and specific treatment of any contributory disease. Prostigmin is also used with success. Under 2. the use of the two ovarian hormones, oestrin and progesterin, is now widespread. Synthetic hormones are available in tablet and ampoule form. Stilboestrol and progesterone are now in common use. Radiotherapy, diathermy and actinotherapy may be of use in suitable cases. (See also Vol. III, Section VIII.)

Menorrhagia.—This is the term applied to conditions of excessive menstrual flow. Some women lose so much every month that they suffer in health and become anaemic, but it is difficult to say where ordinary menstruation ends and where menorrhagia begins because certain subjects have a copious flow (up to 12 oz.) and experience nothing but good from it. However, in the well-established cases of menorrhagia there can be no doubt about the harm done. The causes are legion—abnormal structure and position of the womb, fibroids, disturbed hormone secretion, chronic constipation and liver congestion, anaemia, general flabbiness of the muscular system, obesity, thyroid disease, vitamin deficiency and so on. The evidences are weakness, pallor and general constitutional failings.

At puberty or at the menopause there may be disturbed function of the ovary. This is of great importance, and modern research has proved its association with abnormal physiology of the sex hormones; the endometrium is thickened (generally referred to as hyperplasia); the ovaries are devoid of corpora lutea. As a result of the hormonal imbalance, oestrogen is predominant and progesterone does not play its part in the menstrual cycle. Thus excessive and prolonged bleeding takes place. At the menopause, the condition is sometimes referred to as Schroeder's disease, or by the name he gave to it, metropathia haemorrhagica.

The treatment of menorrhagia depends upon the cause. In most cases, hormone treatment has good results, progesterone, or one of the very numerous preparations, and luteinizing hormone, being now usefully employed. It may be necessary in some cases to resort to curettage, radium therapy or x-ray treatment, or even to radical cure.

Metrorrhagia.—Metrorrhagia is a term used to indicate intermenstrual bleeding, but the meaning has become much more restricted on account of the knowledge now established with regard to the sex hormones. We may therefore consider metrorrhagia as an event rare before puberty, but apt to occur at any time during the reproductive phase of women and after the menopause. This type of haemorrhage always has its origin in some uterine or other local abnormality, and the one disease that suggests itself is cervical carcinoma; the second possibility is cancer of the body of the uterus. Uterine polypi, endometritis, erosions of the cervix, ovarian carcinoma, disease of the uterine tube (fallopian tube) and senile degenerations, general and local, are all possible causes, to be discussed in the diagnosis. With regard to treatment, it is obvious that some radical operation is indicated, and nurses who may suddenly encounter a case of metrorrhagia should lose no time in seeking medical opinion, since early treatment is essential.

Dysmenorrhoea.—This is one of the most difficult conditions to be dealt with. The word, dysmenorrhoea, means “painful menstruation,” but the term should be applied only to those women who are forced to go to bed or to give up their activities owing to the pain. Fortunately the pain passes off quickly when the period begins to function actively. Dysmenorrhoea may cause continuous pain, and in nervous women and girls may lead to hysteria or other desperate mental outlet; it may also be spasmodic in type, like colic, and in fact is often described as “colicky dysmenorrhoea”, and cause great distress and nervousness. Now and then this type is associated with the formation of clots. Another type of dysmenorrhoea is sometimes present during the first months of menstruation; the cause is unknown. Dysmenorrhoea may also occur after a septic infection of the endometrium and after child-birth, as membranous dysmenorrhoea, in which large pieces of the endometrium are stripped off from the uterus; in order to expel these, the uterus must contract strongly, these contractions giving rise to acute pain. The treatment of dysmenorrhoea is one of the most difficult things of general practice, but it seems that with better understanding of the condition, a more satisfactory system of therapy may be evolved. In many cases, sufferers have to go to bed for a few hours, hot water bottles being applied to the lower abdomen,

and a brisk purge being given. It is very dangerous to give hypnotics, and many a girl has been made a drunkard or a drug-addict by being given brandy or morphine for dysmenorrhoea. It is an interesting fact that after marriage, whether there has been a pregnancy or not, dysmenorrhoea is rarely found. Research has proved that certain endocrine defect is at the root of the matter, and promising results are being obtained by the use of ductless gland extracts. A healthy mode of life, with regular moderate exercise, satisfactory diet and recreation are all to be recommended. In suitable cases x-rays may be applied by the expert. Of the surgical methods, dilatation of the cervix is the most advantageous. Presacral sympathectomy has been recommended also.

The Menopause

Some time between the ages of 45 and 50, menstruation ceases and women pass through the period known as the menopause, "change of life" or climacteric. For a year or more, the periods are irregular, scanty or otherwise abnormal, then the cycle ceases altogether, this coinciding with loss of power of reproduction, although not necessarily with loss of sexual desire. The organs degenerate and lose their activity. This time in a woman's life is generally a critical one. First there is the mental aspect to be considered. Apart from the physical changes, including alteration of vital endocrine supply, there are many anxieties not too easy to get rid of or to explain. No doubt worry and doubt have much to do with climacteric ailments; cessation of the normal menstrual function adds to the fears and doubts of pregnancy, but there is also the bitter realization that the era of youth must be for ever abandoned and the woman must face the beginning of old age. In any case a great deal of the nervousness, sleeplessness and mental disruption of the menopause can be cured by the psychologist. On the other hand, certain endocrine drugs can make the transition less oppressive, and the attacks of sweating, hot flushes, fainting and the various aches and pains associated with the change of life are more easily controlled than was formerly the case. The doctor must always be alive to the dangers of malignant disease, however, and will make an examination if necessary; routine examination at the menopause is to be commended, and any woman who has irregular or excessive bleeding at this time should be persuaded to see her doctor.

Vaginal Discharges

There are only two discharges which are normal in the vagina. The first is the slight, glairy, lubricating discharge, a mixture of

secretions from the cervical glands and from the glands of the vaginal mucous membrane; the second is that of normal menstruation. Civilization has brought with it many artificialities of life, and the result of this is that thousands of women suffer from abnormal discharges of varying degree and type. The commonest variety is that of leucorrhoea.

Leucorrhoea.—Popularly known as “the whites,” this discharge may take several forms, but blood is rarely present, hence the name. Its origin may be the uterus, the cervix or the vagina. It must not be confused with the irritative inflammation of the vulva in young children, which may be due to lack of cleanliness, wet napkins, foreign bodies, threadworms or even gonorrhoea. In acute or chronic endometritis, the discharge comes from the uterine lining and is clear and watery, with gelatinous lumps and shreds of epithelium and mucus. When there is a considerable amount of fluid, with an offensive odour, we must think of malignancy. When the discharge comes from the cervix, it is sticky and slightly thicker. The vaginal discharge is very common, and is associated with chronic gonorrhoea, infection with *Trichomonas vaginalis*, congestion, various after-effects of parturition, and inflammation. It is acid, slightly yellow and thick, but more mucoid than sticky. In gonorrhoea a very yellow creamy discharge is present. It will be obvious to the nurse how dangerous it is to neglect any form of leucorrhoea and she should always advise her patient to seek medical advice, especially in view of the fact that the majority of women either ignore its presence or make futile efforts of their own to get rid of it. The ordinary vaginal discharge requires to be treated by constant douching, but uterine or cervical discharges indicate that a very careful examination should be carried out.

Inflammation of Genital Tract

Signs, symptoms and treatment vary according to the situation of inflammation when it affects the genital tract. The following are the commoner affections.

Ovaritis.—Inflammation of the ovary may be found as a result of spread from the uterine tube, from a septic uterus or as a sequel to pelvic peritonitis. The ovaries may become inflamed after mumps (see Section IX). The treatment consists in removal of the cause as speedily as possible, the patient being kept in bed with hot fomentations applied over the lower abdomen. The pain and tenderness may become very acute, in which case hot vaginal douching, with the pelvis raised to allow the hot fluid to reach the vault of the vagina, and the giving of analgesics, are

indicated. Leeching is occasionally resorted to. The bowels should be freely opened by salines.

Salpingitis.—Inflammation of the uterine (fallopian) tube is fairly common. Very often the cause is sepsis occurring after a bad confinement or gonorrhoea. Salpingitis may also be due to debility or a chill. In the non-suppurative cases, there is dull pain, discomfort and slight pyrexia, all of which may quickly pass off, but several attacks may lead to chronic salpingitis, described below.

It must be remembered that the fimbriated end of the uterine tube opens directly into the peritoneum, therefore any sepsis of the tube is almost certain to spread to the peritoneum and cause peritonitis. In many cases, the inflammation leaves adhesions at the peritoneal and uterine ends of the tube, and thus a bag is created. When this is distended with fluid, we call the condition hydrosalpinx, but in the suppurative cases, pus causes a great encysted abscess, and the dangerous condition of pyosalpinx is found. In the latter case, a salutary peritubal inflammation may cause local peritoneal adhesions, and so shut off, partially or completely, the septic centre from the rest of the peritoneum; but it must be obvious to the nurse that even when the abscess is shut off in this way, there must be as many dangers as are found in the abscess of the appendix, which is not so far away. More rarely, blood is found in the tube. The general signs of acute suppurative salpingitis are pain, tenderness and swelling in the fold of the groin; both sides are commonly affected. The temperature rises and swings markedly when the infection spreads. A careful vaginal examination, always done by the doctor, proves the presence of a tender, sausage-like swelling in the recto-uterine pouch.

Treatment.—In the non-septic cases, rest in bed for a few days, with careful clearing of the lower bowel, application to the groins of hot water bottles or other sources of heat, and hot vaginal douching may be all that is necessary. In pyosalpinx, removal of the affected tube or tubes by operation is necessary, with drainage if there is any peritonitis of dangerous type.

Chronic salpingitis often causes menorrhagia, dysmenorrhoea, and recurrent pains which come on when the patient makes any unusual effort such as running or lifting heavy weights or straining at stool. There is painful micturition and constant lumbago. Periods of rest, with regular hot douching, may be necessary, and sometimes the tubes have to be removed. Sterility is often the result of chronic salpingitis.

Endometritis.—Inflammation of the lining membrane of the womb may assume the acute or chronic form. In the former case, a recent septic confinement or an attack of gonorrhoea may be

the cause, and the condition is a serious one, as the uterus is the centre of a purulent activity which may lead to septicaemia. The usual signs of pyrexia of severe type are present, and there is pain and tenderness in the middle line behind the bladder, spreading usually to the whole pelvic region. The uterus becomes enlarged, and an offensive discharge of pus finds its way into the vagina, frequently infecting that passage also. Needless to say, every effort must be made to check the local infection by immersion of the hips in a sitz bath for periods, or by actually passing ribbon gauze soaked in iodine or other disinfectant medium into the uterine canal. The last is invariably done only by the surgeon. Rest in bed, with light diet, and with soothing hot applications made over the lower abdomen, must be the rule if the condition is to get a chance to resolve. Generally there is an associated vaginitis or salpingitis. Sulphonamide drugs should be given by the mouth.

Chronic endometritis is one of the most difficult and most prevalent diseases of women. It may follow an acute attack but is very often due to causes such as poor general health, uterine displacement, tumours and so on. The outstanding symptom is the discomfort caused by a chronic variable discharge which keeps up a state of chronic leucorrhoea. Patients have dull persistent pain in the back, and the periods are irregular. The neurosis associated with this condition is marked, and local treatment is not always successful, even although the patient may spend a few days in bed now and then in order to have special treatment such as hot douching, application of special local dressings (see Chapter 2), and the intensive system of constitutional treatment that is so much in favour today. This treatment comprises electrical stimulation by various currents, ultra-violet and infra-red therapy, diathermy, fresh air, nourishing food, medicated baths, massage, tonic mixtures and recreation, with games and medical gymnastics. In the old days, the curette was much in evidence, the belief being held that regular removal of the unsatisfactory mucous membrane would improve matters, but this method of treatment has rapidly passed out of favour, the operation of curettage having failed to assert itself as a radical cure. The uterus in this operation is gradually dilated by a series of plated dilators, the patient being under an anaesthetic. When a large enough cavity is produced, the curette is applied, and the scrapings are carefully saved for examination.

Vaginitis.—Although the acid secretion formed in the vagina during normal reproductive life acts as a defence against entry of ordinary bacteria, in all acute conditions the vagina becomes inflamed and purulent, especially in gonorrhoea. The severe forms of vaginitis may give rise to atresia or adhesion of the vaginal walls, which may later cause obstruction to the

passage of the menstrual discharge and the formation of a large cavity containing a blood clot (haematocolpos). Atresia is not necessarily confined to the vagina; it is a term applied to closure of any part of the generative apparatus, and it may be of congenital origin.

At puberty, difficulties may be caused by obstruction in the uterine tubes, uterus, cervix, vagina or vulva. The hymen may be imperforate at birth, and with the onset of menstruation an incision (cruciform) may have to be made so that haematocolpos may be prevented.

Treatment.—The common method is that of douching with permanganate of potash, preceded by a douche containing bicarbonate of soda in a strength of 2 drachms to a quart of sterile water. In the case of chronic vaginitis, a sodium chloride douche may be ordered, followed by the insertion of a medicated pessary containing ichthyol, resorcin, iodine or some other antiseptic. Some authorities advocate the painting of the vaginal walls with mercurochrome (2 to 4 per cent), or with a solution of silver nitrate (10 to 20 grs. to the ounce).

Trichomonas Vaginitis.—This is a type of vaginitis caused by infection with a flagellated protozoon—*Trichomonas vaginalis*—which gives rise to an offensive watery irritating discharge. It is met with most commonly in women between the ages of 18 and 40 years. The symptoms complained of are irritation of the vulva very often acute at night, occasional abdominal pain, frequency of micturition, dyspareunia, dysuria, backache and menorrhagia. In virgins the condition is commonly due to infection by the *Trichomonas vaginalis* contracted during a visit to a swimming pool.

The treatment consists of daily swabbing out of the vagina with silver picrate or the insertion of silver picrate pessaries, or of a special antiseptic tablet such as "Devegan" or "Stovarsol". Cleansing douches may be ordered twice a day, preferably before the insertion of the tablets, these douches removing any excessive discharge and debris produced by the previous treatment.

Vulvovaginitis.—This inflammatory condition of the vulva and vagina may be found in children. There is often much vaginal discharge; there may be infection with the streptococcus, *Staphylococcus aureus* or the gonococcus. When the infection is not of gonococcal origin it may be a prodromal feature of chicken-pox or measles or it may occur as a sequel to scarlet fever, pneumonia or influenza. Children so infected complain of irritation and discomfort at night and when walking. There may be profuse vaginal discharge. In such cases small doses of sulphapyridine or sulphathiazole are given according to the weight and age of the child. When the infection is of gonococcal origin, oestrogen therapy is efficient and reliable, the treatment

being given in conjunction with local irrigations of sodium bicarbonate solution or with application of a paint consisting of a 1 per cent solution of mercurochrome.

Displacements

Prolapse of the Ovary.—This may occur when there is a general flabbiness of the pelvic floor but it is usually associated with a retroverted uterus, described below. Owing to the fact that the deep recto-uterine pouch, which lies behind the womb, is a ready pocket for these organs, they are forced into it and they may become compressed. This gives rise to swelling and tenderness behind the posterior vaginal wall, accentuated at the time of the monthly periods.

Displacements of the Uterus.—Normally the uterus is anteverted and it has sufficient muscular tone to retain its position without causing strain. In the event of weakness of the supporting broad or round ligaments or as a result of general prolapse of the pelvic contents, the uterus, which is really the pivotal organ, is at the mercy of the other structures and is pulled one way or another like a marquee in a gale. The nurse need concern herself only with the backward and downward displacements, however.

Retroversion.—The condition known as retroversion is very common; here the attitude of the uterus is towards the rectum instead of towards the bladder. The term, retroflexion, refers to the extreme condition of the above. The fundus of the uterus is bent over the rest of the organ, forming a posterior fold. All varieties are found, however, the cervix usually being tilted forwards. Such positional changes lead to dull pains, irregular menstruation, constipation, lumbago, dysmenorrhoea and inability to have a full-time child, since pregnancy, even if it should occur, often ends in miscarriage. The frequency of micturition and the constipation, together with the leucorrhoeal discharge which commonly supervenes, set up a chronic condition of ill-health and cause endless anxiety and nervous instability. The causes may be traced to difficult labour, which puts a great strain on the ligaments, but even although the patient be kept in bed for a fortnight after confinement, the uterus, if it shows a tendency to lag in becoming reduced to normal size, may by its very weight fall back into the recto-uterine pouch. Any unusual effort—c.g. in athletics—may cause displacement. Disease such as tumour, inflammation or other local abnormalities may also push or drag the womb away from its normal situation. Retroversion may be of congenital origin in some women.

With regard to treatment as a preventive measure, all patients after labour should lie in the prone position for one hour twice

daily, to assist the uterus to return to its normal position. So far as curative treatment is concerned the first thing to be done is to reduce the displacement by bimanual palpation in the knee-chest position (see p. 179). After it has been ensured that there are not any permanent adhesions or other conditions likely to increase the discomfort, a Hodge or ring pessary may be introduced into the vagina, this acting as a firm support to the pelvic floor. Pessaries are worn for many months but alone they are useless. Combined with regular douching treatment, there should be massage and exercises for the abdominal muscles carried out daily under supervision. When all fails, the operation of shortening of the round ligaments should be performed.

Prolapse of the Uterus.—This is a simple falling down of the whole organ, so that the cervix is visible at the vaginal orifice, if it does not actually protrude. In very rare cases, the whole uterus may be extruded (procidentia). Whatever the degree, there is no doubt that prolapse of the uterus is serious from two points of view: 1. it indicates that the whole of the pelvic floor has collapsed; 2. the uterine canal and the cervix are exposed to irritation and congestion, thus inflammation and discharge are common. When the anterior vaginal wall, accompanied by the posterior wall of the bladder, slips down in a fold at the vaginal orifice, the condition is known as cystocele; this is quite common and leads to vesical irritation with frequency. On the other hand, when the posterior wall of the vagina, with the anterior wall of the rectum, is prolapsed, the condition is called rectocele. Owing to the stronger character of the posterior part of the pelvic floor this is not so common.

The signs and symptoms are discomfort, with frequency, constipation, pelvic pain and tenderness, backache and, when the *os uteri* is obvious at the vaginal orifice, a natural realization on the part of the patient that the womb has "fallen." The condition is markedly accentuated if the patient be told to bear down on the uterus by making an abnormal effort with the pelvic and abdominal muscles. In the treatment, the aim is to correct the defect, together with removal of any tumour or influence acting intra-abdominally or within the pelvis. In most cases the pessary is but a temporary adjustment and operation must be faced. Plicats may be made in the vaginal walls, front and back, so that, by the operations of anterior or posterior colporrhaphy, the vagina is universally narrowed; any laceration of the perineum must be repaired (perineorrhaphy) and the surgeon may narrow the vaginal outlet; or the cervix may be amputated. When the patient is near the menopausal age, it is customary also to perform the operation of ventrofixation of the uterus; when, however, the patient is of child-bearing age, the round ligaments may be shortened.

Neoplasms of Ovaries and Uterus

Both simple and malignant tumours commonly occur in the female generative organs. Cysts are commonly found also. The following are the most important conditions.

Ovarian Cyst.—This may take several forms. First there is the small simple cyst, innocent and forming a single cavity containing a yellowish-green serous fluid (unilocular cyst). This may grow until it bursts, with natural cure. The usual ovarian cyst, however, is multilocular, and may be of papillomatous type and malignant although it is often benign. The dermoid cyst is occasionally found. The characteristic of an ovarian cyst is its possibility of expansion. Some become (if allowed to grow) enormous in size, and may contain many pints of fluid. The symptoms are those of visible enlargement, a state of pregnancy being sometimes wrongly diagnosed. As time goes on, pressure on the neighbouring structures causes frequency, constipation, varicose veins, peritonitis and disorganization of function owing to adhesions. When pregnancy occurs in a woman who has an ovarian cyst there are many complications, not only during the pregnancy but also when labour starts, since the cyst causes a serious obstruction and is in addition a grave menace by reason of its liability to burst. In a well-developed cyst the dangers, apart from rupture, are those of: 1. septic degeneration of the cyst and its contents, leading to grave peritonitis; 2. sudden twisting of the pedicle, or stalk, of the tumour involving strangulation of the vessels and all the sequelae of such occurrences; 3. haemorrhage of the cyst; 4. malignant degeneration.

Treatment.—In the urgent conditions, such as twisting of the pedicle or sudden rupture, an immediate operation must be done. Otherwise it is always advisable to do the operation of ovariectomy, or removal of the ovary, which may be as simple as any other abdominal operation of straightforward type. The preparations are those of an ordinary abdominal section. The ovary is carefully isolated and removed and all the vessels are tied. The patient may fully recover in from 3 to 4 weeks. At the operation it may be necessary to tap the cyst before it is removed.

Ovarian Solid Tumours.—Solid tumours of the ovary may be simple or malignant, but they are rare. They give rise to pressure symptoms, to pain and to sickness. In malignant tumours a certain amount of free fluid may be found in the abdominal cavity. The treatment is that of removal, together with any of the neighbouring tissues affected.

Fibroids.—These neoplasms are very common in the uterus; they consist of a mixture of fibrous and muscular tissue, and are therefore, properly speaking, fibromyomata, but they are

universally referred to as fibroids. As a general rule more than one fibroid is present and they vary in size and degree of hardness according to their stage of development, their site and their constitution. Most fibroids are found at the fundus and they may occupy 3 well-known sites as follows: 1. under the mucous membrane (submucous); 2. within the muscular substance of the uterus (interstitial); 3. under the peritoneal covering of the uterus (subperitoneal). The submucous and subperitoneal varieties may have a "stalk" (pedunculation) like a nasal polypus or an ovarian cyst. When they grow to any size, they cause symptoms of pressure, pain, disorganization of the pelvic organs, dysmenorrhoea, menorrhagia, metrorrhagia, leucorrhoea and general debility, and if pregnancy should occur when they are present, the tumours are either removed early in the pregnancy (a very delicate operation) or the pregnancy is terminated. Probably 40 per cent of all women suffer from fibroids but many are non-productive of symptoms, as they degenerate and leave small aborted nodules behind. It is believed that in some way the fibroid is evidence of an autogenous effort on the part of the womb to reproduce something, as fibroids always increase rapidly when pregnancy occurs and they are much commoner in spinsters between the ages of 30 and 45 than in other types of women. The most difficult symptom to deal with, even in moderate fibroids, is haemorrhage, which may occur as "floodings" or attacks of metrorrhagia with considerable loss of blood. The patients are obviously anaemic and weak after a few of these unfortunate losses and their condition generally leads to the consideration of the radical operation of excision of the growths or total hysterectomy, sub-total hysterectomy and myomectomy or hysterectomy (removal of the womb). With regard to myomectomy in women under 40 years of age, the only disadvantage of this operation is that other fibroids may develop in the uterus, and may necessitate removal of the uterus later. Hysterectomy may be complete (total) or partial (sub-total). In the less severe cases, the patient is put to bed for a few days and kept very quiet; in former days, ergot was given freely, but now it is recognized that this drug may not in many cases have much effect. If a fibroid is not removed, it may become cystic and there is then added the danger of sepsis; the smaller ones degenerate as mentioned above, but now and then malignancy may supervene.

Treatment, apart from operative measures, is by ergot in suitable cases, "Pitocin" by intramuscular injection and other drugs which control uterine bleeding. Radium and x-ray treatment has had some success. In many cases the symptoms subside after the menopause.

If the submucous fibroid should become polypoid in character,

it may be dealt with by the operation of vaginal myomectomy, in which the tumour is either twisted off or dissected out, the surgeon operating through the vagina, with the cervix fully dilated.

Cancer of the Uterus.—Cancer of the uterus is unfortunately too common; in women who have had a family and who are approaching the menopause, the disease generally attacks the cervix, but at any age between the thirties and the sixties, and unassociated with pregnancies, we may find this disease. The great difficulty about cervical cancer is that it is often unrecognized until it is fully established and then it may be too late to stop the malignant influences from pervading the whole pelvic region. For instance ulceration of the cervix of less serious type may be found as a result of a tear during childbirth, of constant irritation of a chronic discharge (erosion) or of venereal disease. The skilled finger, however, can detect the hard edges of the cancerous ulcer, this feature distinguishing it from the other types. Whereas the ordinary erosion may be quickly cleared up by appropriate antivenereal measures, by excision, by scraping or by electrical applications, cancer of the cervix requires more vigorous treatment; today, while the surgeon tries to remove most of the frankly malignant tissue, he may find that radium locally applied gives the best results. In many cases, however, widespread excision is indicated, including hysterectomy and removal of many appendages and neighbouring structures.

In many instances the nurse will be able to bring early cases to the notice of the surgeon. All women shudder at the thought of uterine cancer and many of those affected may go on suffering the ever-increasing discomforts of pain, discharge of evil-smelling blood-stained fluid, attacks of bleeding and cachexia, rather than be labelled officially as cancerous subjects; nevertheless every endeavour should be made to have such patients put under medical treatment as early as possible so that the maximal benefits may be obtained from x-ray and radium treatment. The slightest abnormality of function, pain or discharge in any woman over 35 who has previously been perfectly regular and normal should be most thoroughly investigated without delay. At the menopause such examination is very important. Nurses should never forget that in established cancer of the womb, whether it occur in the cervix, or more rarely in the body of the uterus, the mortality rate is very high.

In many cases, the treatment of cancer of the uterus must of necessity be palliative in character. Every effort should be made to make the patient's lot as happy as possible in the circumstances. The moral effect of conservative treatment helps to reduce the inevitable depression of the mind. Hot vaginal douching, packing of the vagina with deodorant gauze, relieving

the discomfort and soreness of the vulva by the use of zinc ointment, adoption of fresh air routine, giving of ergot, and in the advanced stages, of morphine, all are part of the nurse's daily routine. Radium and x-ray treatment should be in the hands of the expert.

CHAPTER 2

PRINCIPLES OF GYNAECOLOGICAL NURSING

PREPARATION OF PATIENTS FOR EXAMINATION. PRELIMINARY MEASURES. POSITION OF THE PATIENT. SPECIAL NURSING MEASURES. VAGINAL DOUCHE. TAMPONS. PLUGS. PESSARIES. INSTRUMENTS IN COMMON USE. ROUTINE EXAMINATION. IN THE THEATRE. NURSING AFTER MAJOR AND MINOR OPERATIONS.

THE general rules of nursing procedure apply to gynaecology as well as to all other special branches of medicine but in this chapter are briefly reviewed the special measures to be adopted in dealing with diseases of women.

Preparation of Patients for Examination

There are many ways of examining the generative system. The patient may see the doctor at his consulting room or at the out-patient department and there administration of an anaesthetic may or may not be necessary. In the ward the doctor may make only a superficial examination, waiting until the patient is on the operating table. But whether an anaesthetic be given or not, it is customary for all doctors to insist on the presence of a nurse at examinations on female patients; failing that, a reliable relative may suffice. The nurse, by understanding the procedures of female examination, may help the doctor considerably. The preparation of the patient, both from a physical and mental point of view, may make gynaecological investigation, never a very pleasant proceeding, much less irksome to the patient and doctor alike.

Preliminary Measures.—Ordinary examination of the vagina, uterus and ovaries, involves external and internal examination, but there is no need to shave or prepare the region for operation. All that need be done is to ensure that both the bladder and rectum are empty, the catheter or enema being used if necessary, and that pessaries or other appliances are removed from the vagina. In some cases a hot vaginal douche may be given but generally the doctor chooses to observe the discharge in its active state. The external genital organs should be swabbed

with soap and water just before the examination. Much, of course, depends upon the circumstances, but the above applies to the patient who is in bed and who is being attended daily by the doctor. Examinations should be avoided during menstruation. When the patient is not in bed she should be asked to remove her clothes and be provided with a nightgown, dressing gown and slippers. When such procedure is impossible the nurse should make sure that the patient's underclothing is loose and easily cleared away from the site of the examination when the time comes for the doctor to interview the patient. Nurses must keep in mind that gynaecological examination involves inspections of the breasts, the abdomen, the pelvic organs from the outside and from the inside, the use of instruments and the collection of test matter, so that all these must be provided for.

Position of the Patient.—The first thing to be done is the general survey and palpation of the breasts and abdomen, for which the recumbent position is required, the patient lying flat on her back with muscles relaxed. The bedclothes should be folded back as far as the pubis, while the nightgown should be folded up as far as the neck. When the primary survey has been made, it may be necessary to examine the patient as she lies in the left lateral position, with the right knee drawn up. During this rather delicate examination, very often carried out in virgins under an anaesthetic, the bedclothes should cover as much of the body as possible above the pelvic region; in many cases it is sufficient to roll the bedclothes over the patient from one side. One pillow is required for the head. The buttocks should be as near the edge of the bed as possible. In rare cases, the patient may be placed lying on her face (prone position).

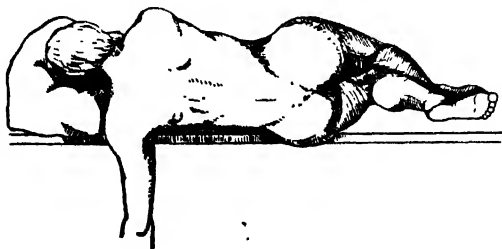


FIG. 116.—SIMS'S POSITION.

Special Positions.—In Sims's position, the patient lies almost on her face, as described in Vol. III, p. 14. This permits the easy inspection of the external genitals and the introduction of Sims's speculum. It also allows for examination of the vagina and cervix by the index and middle fingers of the doctor's right

hand, used as a unit of investigation. In adopting the bimanual method of examination, with the fingers of the right hand in the vagina and the left hand applied externally and used to press the upper part of the womb, broad ligament, uterine tubes and ovaries towards it, the doctor may have the patient in the dorsal position, with the thighs as far apart as the situation allows and the knees slightly flexed. The nurse must see that the patient is covered as much as possible by blanket or sheet. It must not be forgotten that the doctor may wish to pass a female catheter or to examine the patient per rectum.

A third position is the genupectoral (knee-chest or knee-elbow) position (Fig. 117). This illustration explains itself. The

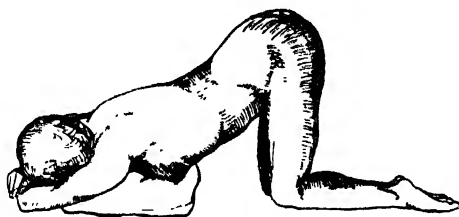


FIG. 117.—THE KNEE-ELBOW (GENUPECTORAL) POSITION.

position is used only when some displacement of the uterus is not possible of reduction otherwise. The points to remember are: 1. a pillow for the breasts and head of the patient; 2. thighs vertical and slightly separated; and 3. legs, covered by thick stockings, extending beyond the edge of the table. When the patient is in this position, the pelvic contents hang downwards towards the chest. The lithotomy position may be used with Clover's crutch, now somewhat out of date, or the patient may be placed with the hips on the edge of the table and the legs supported by chairs so that the thighs are well flexed on the abdomen. The lithotomy position is commonly used for operations in the vaginal and perineal regions. Instruments and appliances are described below.

Special Nursing Measures

Vaginal Douche.—Apart from the routine vaginal douching with warm water which is carried out by the majority of women as a hygienic measure, there are various specified types of vaginal douche, such being used in disease or abnormal functional conditions. Many women cause uterine and vaginal troubles by improper use of douches. The opinion is held among many eminent gynaecologists that since the normal secretion of the vagina is acid, it has a destructive effect on the majority of the

pathogenic organisms. Nature never intended that the vagina should be douched; it is surely wrong to neutralize or to wash out the secretion. Vaginal douching may cause congestion; if

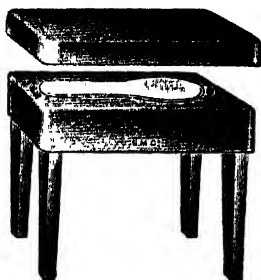


FIG. 118.—BIDET.

(By courtesy of the Surgical Manufacturing Co., Ltd., London.)



FIG. 119.—KELLY'S DOUCHING CUSHION.

the treatment be prolonged, it may cause dysmenorrhoea and pelvic pain; in infection such as gonorrhoea, douching may cause infiltration of the organism to the uterus, ovaries, uterine tubes and peritoneum.

Vaginal douching should be undertaken only under the advice of a medical practitioner. The nurse should know how the operation should be carried out. Higginson's syringe or the whirling spray may be all very well in the home, but in the sickroom or hospital the nurse must use a douche can. In time the patient may be taught how to carry out the treatment, and in many cases does so quite well.

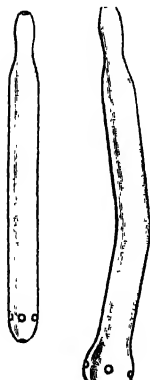


FIG. 120.—GLASS VAGINAL DOUCHE PIPES.

(By courtesy of the Surgical Manufacturing Co., Ltd., London.)

The douche can is set above the bed, usually about the level of the top upper rail or higher if necessary. It is provided with several feet of rubber tubing, a glass vaginal tube, or a full-sized rubber catheter, and a clip placed at the end of the rubber tube to regulate the flow of lotion. If the patient is in bed, Kelly's flushing douche cushion and pad may be used, or a large-size bed-pan on a mackintosh, but perfection type bidets are ideal for persons who can get up (see Figs. 118 and 119). Various lotions may be used—weak solutions of phenol,

alum, potassium permanganate or mixtures and these are made up in a large enamel jug from which the can may be refilled, the temperature being anything from 105° to 120° F., according to

FIG. 121.—PLAYFAIR'S PROBE (ALUMINIUM).

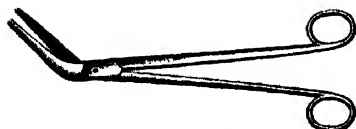


FIG. 122.—UTERINE SCISSORS (ANGULAR).

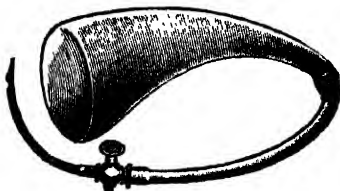


FIG. 123.—DE RIBES'S BAG.

FIG. 124.—UTERINE CURETTE.

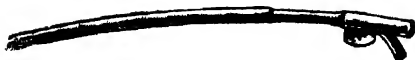


FIG. 125.—FEMALE CATHETER IN SILVER
(TELESCOPIC).

(By courtesy of the Surgical Manufacturing Co., Ltd., London.)



FIG. 126.—LUCY'S
UTERINE PROBE.

the nature of the complaint. It should be remembered that when a hot fluid is used the vulva should be smeared with sterile "Vaseline" to avoid scalding as the hot fluid runs out.

The patient should have the hips raised if possible, and sometimes the Sims's or the lithotomy position is used; during the operation, care should be taken that the patient is well covered by a blanket. After a preliminary toilet of the vagina, the nurse, wearing rubber gloves, passes the sterilized glass tube (or rubber catheter) as close to the posterior vaginal wall as possible, and should aim at putting the end of the glass nozzle in the posterior fornix. A lubricant is not necessary because the natural secretion replaces this need; if a lubricant is called for, soft paraffin may be used. The tap is opened, the steady flow is kept up, and the returning fluid is collected in the appropriate receptacle—bed-pan, bucket or other container. The tube is carefully withdrawn after the douching is over, and the perineum is well dried with a soft clean towel or sterile swabs—and a sterile pad is applied to the vulva. A Turkish towel or napkin should be placed below the buttocks to catch any remaining fluid, which slowly collects and trickles out.

Intra-uterine douches are always given by the doctor unless the nurse is specially qualified to do this. The cervix is dilated, a two-channel tube is passed and a gentle douching is carried out.

Tampons.—A tampon is a special type of swab, made by enclosing a piece of cotton wool, about the size of a table-tennis ball, in a layer of gauze; to this little bag is attached a long piece of fine tape. The bag is applied to the lower part of the uterus by passing it into the vagina through a Sims's speculum by means of a special pair of long-bladed forceps or by using a special introducing speculum and wooden rod. Tampons are used dry when employed in cases of hæmorrhage. By saturating the tampon with drugs, antiseptics and so on, and leaving it in position for a few hours, we can obtain a concentrated effect at the cervix. The tape is allowed to hang out of the vagina and by pulling on it the tampon can be removed. A vaginal douche may be ordered after removal of the tampon. Care should be taken to apply a dressing to the perineum while the tampon is in position, as very often bedclothes and wearing apparel are ruined by escape of lotion. Tampons are used in the treatment of inflammatory conditions of the vagina, uterus, uterine tubes, ovaries, pelvic cellular tissue or pelvic peritoneum.

Plugs.—In an emergency, it may be necessary to plug the vagina. After the bladder has been emptied, the surgeon passes a Sims's speculum and through its canal he introduces with a pair of long uterine forceps a long strip of ribbon gauze at least

2 inches wide. In cases of severe haemorrhage, the vagina should be packed very tightly.

Pessaries.—The gynaecological pessary must be distinguished from the pharmaceutical pessary, which is a medicament. Pessaries used in gynaecology are intended to support the structures, and therefore are used largely in displacements of the

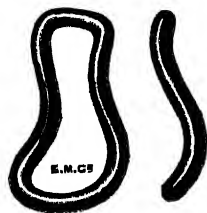


FIG. 127.—VULCANITE PESSARY (HODGE'S).

(By courtesy of the Surgical Manufacturing Co., Ltd., London.)



FIG. 128.—RING PESSARY.

(By courtesy of the Surgical Manufacturing Co., Ltd., London.)

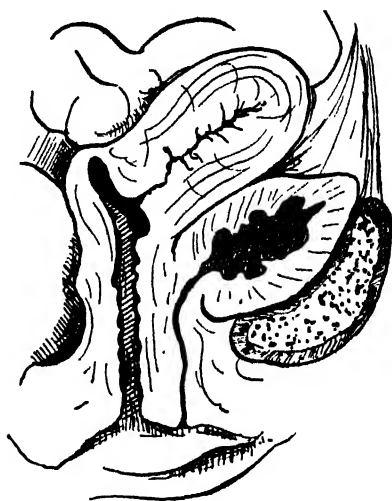


FIG. 129.—THIS REPRESENTS SEMI-DIAGRAMMATICALLY THE POSITION OF A HODGE PESSARY SUPPORTING THE UTERUS.

womb. The various types must be recognized, but all form extra "rafters" to support the upper vaginal dome on which the uterus rests.

The surgeon or doctor will always pass the pessary and it is not an easy matter, especially with the watchspring type, which must be passed firmly closed. The details of such operation are therefore outside the scope of nursing, but the preparation of the patient and of the pessary itself are of supreme importance. The illustration shows how the pessary should be situated when properly fixed (Fig. 129). The patient should be prepared by having the bladder and rectum emptied and the vagina douched. The ring pessary may be heated in water to make it soft; when properly applied it is an ideal support. It should be sterilized and lubricated with soft paraffin and boracic acid. Nurses must be prepared for complaints about discomfort for the first few days.

Any complaint of persistent pain, however, should be reported to a doctor; the pain may be due to pressure, which may lead to ulceration, or to pressure on an ovary from the back of the pessary. A daily hot douche is essential and the nurse should carefully instruct the patient how to douche and how to sterilize

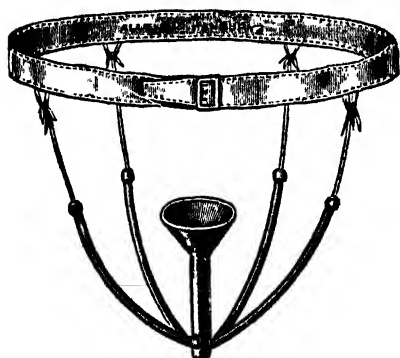


FIG. 130.—NAPIER CUP AND STEM PESSARY.
(By courtesy of Messrs. Allen and Hanbury's, Ltd.,
London.)

the douche nozzle. The pessary should be removed, destroyed and replaced by a new one after 3 months or less. If there is any cause to believe that undue irritation is going on (e.g. by the presence of excessive discharge) the doctor must be informed.

The Napier cup and stem pessary is used in the case of the elderly patient with procidentia on whom operation is inadvisable. It should be removed at night and carefully

cleansed; it should be reinserted before the patient gets up in the morning (Fig. 130).

Instruments in Common Use

Routine Examination.—For the ordinary routine examination the following equipment should be set out.

Hot water, lotions, basin with biniodide solution (1 in 2,000) or "Dettol" (1 per cent), kidney basin, glass jar with swabs, sterile rubber gloves or set of fingerstalls, boric acid in soft paraffin, tray with uterine speculum, uterine sound, probes, dilators, swab or sponge holders, scissors, tampons, cotton wool, diapers, vulsellum forceps, electric torch, female catheters, swabs and slides for pathological specimens and a selection of pessaries. Sterilization should be carried out as completely as possible.

In the Theatre.—The instruments in common use are as illustrated. In addition to the usual surgical scissors, forceps and scalpels, we require Playfair's probes, which are specially roughened at the tip so that they may hold a dressing of cotton wool or gauze, graduated cervical dilators, myoma screw, ovariectomy trocar, vaginal clamps, vulsellum forceps, pedicle needle, curettes, female catheters, angular scissors for perineorrhaphy, Fergusson's speculum, Auvard's speculum, Sims's speculum, Clover's crutch, retractors and a selection of pessaries

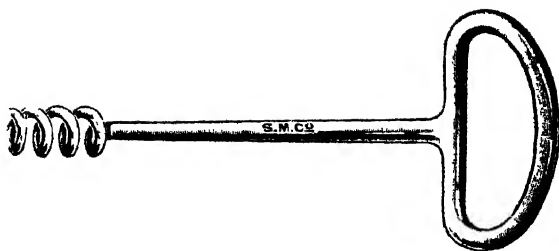


FIG. 131.—DOYEN'S MYOMA SCREW.

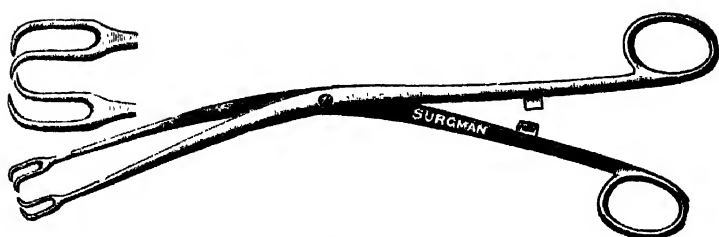


FIG. 132.—SKEENE'S VULSELLUM FORCEPS.



FIG. 133.—PERINEUM NEEDLE.



FIG. 134.—FEMALE CATHETER (ROTUNDA PATTERN).

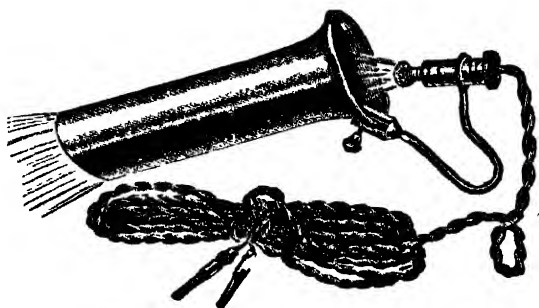


FIG. 135.—FERGUSSON'S SPECULUM, WITH ELECTRICAL ATTACHMENT.
(By courtesy of the Surgical Manufacturing Co., Ltd., London.)

(Hodge's ring pessaries, watchspring and any other special type required).

The preparation of Playfair's probes requires some skill. A sterile rubber glove is put on the left hand, on the palm of which is spread a thin film of sterile cotton wool, $2\frac{1}{2}$ inches square. The probe end is moistened with sterile water. It is placed on the



FIG. 136.—AUVARD'S SPECULUM.

(By courtesy of the Surgical Manufacturing Co., Ltd., London.)

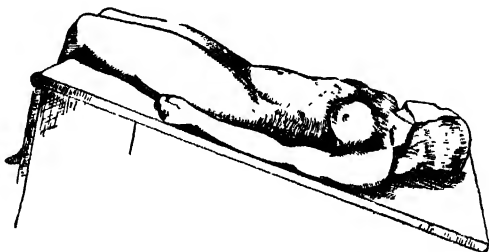


FIG. 137.—TRENDLENBURG POSITION.

cotton wool and while the left hand is closed, the probe is twisted round two or three turns to wind on the wool. This is an excellent appliance for swabbing the narrow uterine canal, and by dipping the tip in lotion or other agent the mucous membrane may be directly dealt with. The soiled swabs can easily be unrolled under hot water, forceps being used.

The theatre table should be prepared so that either the lithotomy or the Trendelenburg position may be used (Fig. 137).

Nursing after Major and Minor Operations

Before a gynaecological operation, the patient is not only prepared as for any other major operation or as for routine examination already described, but special attention must be paid to the emptying of the bladder and rectum, and the pubic area should be carefully shaved. Special attention must be paid to the giving of enemas and douches immediately before operation. A catheter should be passed and left in position so that the bladder can be drained in the theatre; the catheter is afterwards removed.

Nursing after Major Operations.—The chief major operations of gynaecology are hysterectomy, total or partial (removal of the uterus with or without the vaginal portion of the cervix) and inclusive or not, as the case may be, of the appendages; Wertheim's operation, which leaves only part of the

vagina and which clears out as much of the pelvic disease as is practicable; ovariectomy; myomectomy (removal of a fibroid by shelling it out from its uterine site); salpingectomy; operations for displacements (ventrofixation, shortening of the round ligament); vaginal hysterectomy; colpotomy (drainage of a blood extravasation through the recto-uterine pouch); operations on the cervix; repair of the perineum, when it is seriously damaged by tears, etc.; and treatment of pelvic peritonitis or cellulitis.

The after-treatment so far as the above operations are concerned is to return the patient to bed and while she is still unconscious, a rectal drip saline of one pint is given (it is more completely retained while the patient is unconscious). If there should be severe collapse a blood transfusion is given. It is sometimes necessary to pass a catheter during the first 24 hours, or a catheter may be left in the urethra and the bladder drained every 4 or 6 hours. It is possible to avoid catheterization in most cases if, as soon as vomiting ceases, 20 grains of potassium citrate in hot water is given by mouth 3 times daily, fruit drinks being also given frequently. Swabbing the vulva with damp sterile swabs and dusting with sulphonamide powder is carried out after every passage of urine and faeces for 3 or 4 days after the operation of perineorrhaphy.

Douches are very rarely ordered. An enema is generally given on the 3rd day and thereafter liquid paraffin (1 ounce twice daily). Other methods of after-care are as described under abdominal operations. A knee pillow is not allowed on account of the danger of thrombosis; a support for the feet for the first 3 days helps to maintain the sitting position. Breathing exercises daily, and after the 3rd day leg exercises (bending and drawing up the knees) several times daily helps to avoid the danger of thrombosis of the femoral vein. If thrombosis should occur there is pain, swelling and heaviness of the leg. Treatment is to rest the limb, and to apply soothing dressings of heat or of *lotio plumbi*. Another method of treatment is to apply a firm "Elastoplast" bandage and encourage movement of the limb.

Nursing after Minor Operations.—The minor operations of gynaecology include curettage, repair of minor tears of the perineum, cervical dilatation and removal of small external tags or caruncles. Curettage is not so commonly used as formerly, and although it is generally regarded as a minor operation it may lead to serious consequences if there is any neglect. The surgeon dilates the cervix with carefully graduated Hegar's dilators, and then, using a special uterine curette, he scrapes off the endometrium, leaving a raw surface on which will soon form a new lining for the womb. The nurse need not concern herself with the details of the operation. The after-treatment consists of at least 4 days in bed, with daily vaginal douches only if specially

ordered, and the patient must be told that the menstrual discharge which follows the operation will be a profuse one. In all other minor operations, rest in bed for at least 48 hours is advocated. The nurse and patient should both keep in mind the need for frequent lavage of the affected part.

SECTION XII

INTRODUCTION TO OBSTETRICS

CHAPTER I

PREGNANCY

PREGNANCY AS A NATURAL STATE. FERTILIZATION. THE EARLY EMBRYO. THE DECIDUAL MEMBRANES. GROWTH OF THE EMBRYO. IMPORTANT STAGES OF FOETAL DEVELOPMENT. CLINICAL PICTURE OF PREGNANCY. EARLY SYMPTOMS AND SIGNS. SYMPTOMS AND SIGNS OF THE MIDDLE PERIOD. SYMPTOMS AND SIGNS OF THE LAST PERIOD. DIAGNOSTIC TESTS FOR PREGNANCY. BIOLOGICAL TESTS. RADIOLOGICAL TESTS. POSTMATURITY. PSEUDOCYESIS. SYSTEMIC REACTIONS IN PREGNANCY. THE SKIN. CIRCULATION. DIGESTION. NERVOUS CHANGES. PSYCHOLOGICAL CHANGES. URINARY SYSTEM.

IN this Section no attempt is made to give more than the framework upon which the full knowledge of obstetrics may be built. The general nurse must be prepared to deal with childbirth or with its sequels when the emergency demands action. Even although she may not be a qualified midwife she is expected to put to use what knowledge she may have of parturition and of the events associated with it. For this reason it is laid down in the regulations for training that the nurse taking her General course must show proficiency in the elements of midwifery; this part of the course is wisely termed an introduction to obstetrics, since it is obvious that in the time at her disposal the nurse can gain a knowledge of only the main principles involved. In the pages which follow, the simple and the common facts of midwifery are discussed and no claim is made that in any way these chapters are complete.

Pregnancy as a Natural State

The state of pregnancy is a natural one and is intrinsic to any female animal with healthy organs and normal functions. It is absurd to regard pregnancy as belonging to the category of disease. Of the moral and mental aspects of pregnancy nothing

need be said now; so far as the physical and physiological factors are concerned, there are abnormalities which may amount to diseases, but the questions will ever be put: Was the female of primitive Man like any other animal, parturition taking place with the minimal disturbance of such domestic routine as there may have been, and is child-birth today the event that accentuates all the harmful influences of civilization? These, and many other similar questions, raise controversial points, and it is better to avoid them, since the practical issue of study is the rendering of all assistance to the mother and child at a birth under modern conditions.

Fertilization.—As already stated in Vol. I, pp. 294 and 295, pregnancy is effected by the fusion of the spermatozoon and the ovum in the normal physiological manner. Such fusion may be

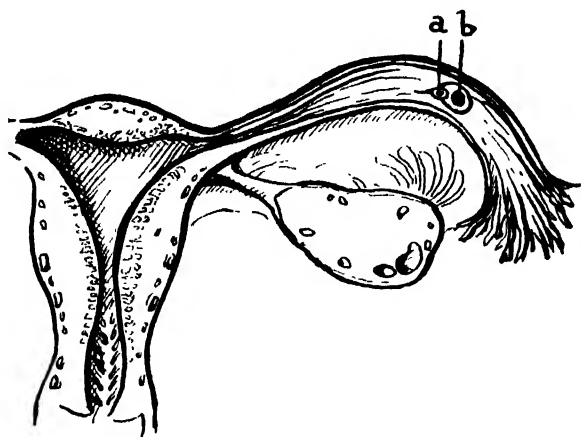


FIG. 138.—SEMI-DIAGRAMMATIC DRAWING TO ILLUSTRATE THE SITE AND METHOD OF FUSION OF SPERMATOZOON AND OVUM IN UPPER $\frac{1}{3}$ OF UTERINE TUBE.

a, Nucleus of spermatozoon; *b*, Nucleus of ovum.

said to mark the commencement of obstetrics, for intra-uterine life has a strong influence on the ultimate condition and character—i.e. the health—of the new human being. This is clearly emphasized by the importance widely acknowledged to be attached to the antenatal phase—the period of 9 months during which there is a bewildering sequence of events ending in child-birth. The nurse has a very big part to play; although the mother-to-be has the responsibility for providing the essentials for normal development, nevertheless the nurse by her knowledge and guidance should be able to give substantial assistance during the whole of the antenatal period. It is advisable therefore that

she should be aware of what is happening in the uterus from the moment of fertilization.

The Act of Fertilization.—Although the child develops in the cavity of the uterus, fertilization does not take place there. The single spermatozoon destined to enter the ovum finds its way up the uterine tube and encounters the ovum as a rule at a point about two-thirds of the way towards the fimbriated end. The fused ovum and sperm cell (zygote) may remain here for about

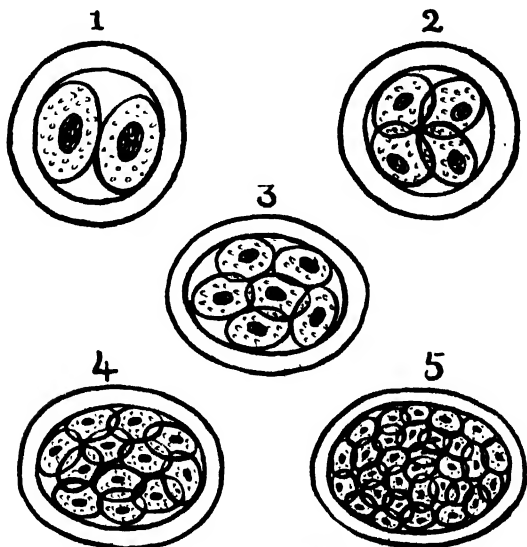


FIG. 139.—FORMATION OF THE MORULA IN THE FERTILIZED OVUM. THE PROGRESSIVE SUBDIVISION OF CELLS IS SHOWN IN 1 TO 5.

a week; this is no chance period—it is all according to Nature's plan. The female hormones, already discussed in various parts of this work, must have a few days in which to prepare the bed in the lining membrane of the uterus, and when their work is done the fertilized ovum descends to the uterus, sinks into and is enveloped by the thickened endometrium and begins its uterine career proper (blastocyst). Since the present study is much limited, no mention is made of the various processes of subdivision and of specialization applicable to mitotic division (see Vol. I, pp. 3 to 5) or to the chromosomes or any of the other elements associated with development of the embryo in the first week. Suffice it to say that the existence of the blastocyst, when it has become embedded in the uterine lining, is the proof that fertilization has in effect occurred.

The Early Embryo.—The blastocyst is the earliest example of differentiation of the embryo into distinct layers. In the first week the cells by constantly dividing and redividing form a mass often referred to as the mulberry mass or morula, there being a conglomeration of simple globular cells. With the implantation of the embryo, however, the fertilized ovum takes on the characteristics of specialization. The blastocyst is oval rather than round and may be visible, as it is anything from 1 to 2 millimetres in diameter. The morula tends also to become hollowed out so that there is now a cavity with soft watery cells (mesenchyme);

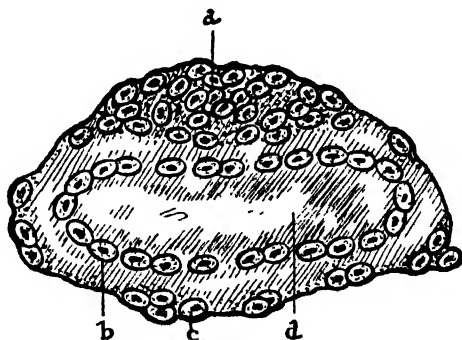


FIG. 140.—FORMATION OF BLASTOCYST.

a, Embryonic cells; *b*, Inner layer of nucleated cells;
c, The Syncytium; *d*, Mesenchyme (semi-fluids).

at one pole certain vital embryonic cells are grouped together. Otherwise the blastocyst, as seen through the lens of the microscope, is found to consist of 2 layers—the outer one (syncytium) consisting of rough and irregular cells, the inner one of homogeneous nucleated cells regularly arranged. The 2 layers are together known as the trophoblast; the latter has the power of eroding the endometrium and literally of eating its way into the substance of the lining membrane, thickened and ready for its reception on account of the transfer of the hormonal action of the corpus luteum to its own substance.

The Decidual Membranes.—What changes have occurred in the uterine mucous membrane? It is clearly thickened and bears no signs of becoming shed as in ordinary menstruation; after the 28th day in the normal menstrual cycle, with the luteal hormone not available, the uterine lining would be found to consist of several layers, clearly to be seen under the microscope. These layers are collectively known as the decidua.

Layers of the Decidua.—There are 4 distinct layers. The first is called the compact layer; it is the innermost layer, forming the

uterine "wallpaper." It is composed of connective tissue cells packed very closely together.

The 2nd layer lies immediately outside the compact layer and is known as the spongy layer, because there are many open spaces, with ample supply of lymph and blood; it is the area from which the embryo obtains its nourishment.

The 3rd layer resembles the ordinary endometrium of the normal uterus, lying as it does on the muscle layer; its function is to stimulate and keep up the supply of nourishment for the spongy layer. It is generally referred to as the unaltered layer. Between the 2nd and 3rd layers, and more or less contributed to by both is an intermediate area, spoken of as the 4th layer, but more generally known as the perforation layer, since it forms a row of perforations similar to those found on postage stamps; here we have the area from which later the mature placenta will be detached, leaving the uterine mucous membrane so that the latter is ready to return to its normal state.

Growth of the Embryo.—The science of embryology deals completely with every stage in the development of the full-time child, but all that the nurse requires to have is a summary of the main events.

It can be quite well imagined that with the constant addition of more and more complicated structures the embryo shows daily changes. The blastocyst divides into 3 important layers as follows: 1. the outer layer or ectoderm—here are the elements of the skin, salivary glands, mammary glands, nervous system and some of the digestive tract; 2. the middle layer or mesoderm, the origin of bone, muscle, connective tissue, blood vessels, renal and generative systems; 3. the inner layer or entoderm—the forerunner of the liver, spleen, bladder and certain other glands, as well as of the lining epithelium of the respiratory tract.

Landmarks in Foetal Development.—The unborn child is commonly referred to as the foetus. At the end of the first month of pregnancy the foetus is usually about the size of a pigeon's egg; the 3-month foetus is typically the size of a cricket ball. Much has happened in 12 weeks. In the first place the outer coat of the blastocyst, the medium which transfers nourishment from the uterus to the ovum, forms itself into a bag containing fluid; in the latter is suspended by a delicate tag the true embryo. The outer part of this bag becomes covered with villi, so that the surface resembles the seed case of a sweet chestnut; it is generally referred to as the chorion, and the soft fleshy outgrowths are known as the chorionic villi. Now it is very important to recognize that although at the beginning all the villi dip into the decidua basalis of the uterus and bring nourishment to the embryo, very soon this arrangement becomes modified so that

after about 9 weeks all the chorionic villi except those dipping into the basal decidua begin to wither and merge into the chorion itself; so far as the basal portion is concerned (the point at which the zygote entered) the villi become more accentuated.

Meanwhile as a kind of lining of the bag, and spreading like a smooth enamel over the inner surface of the chorion, is a fine

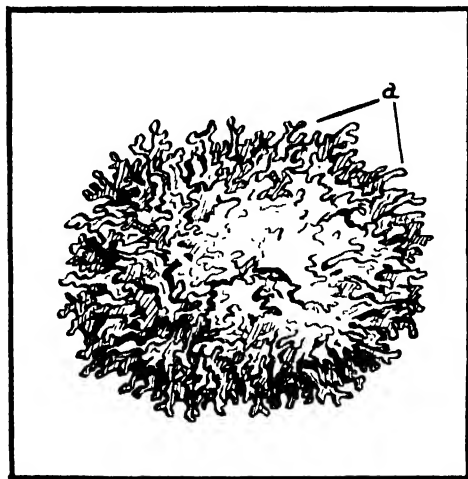
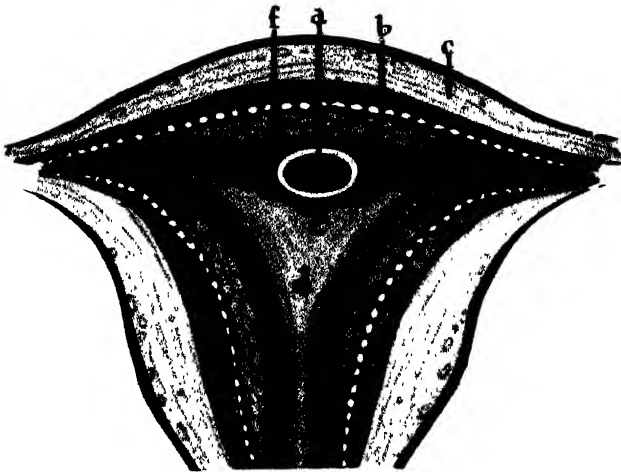


FIG. 141.—THE 6-WEEK OVUM TO SHOW THE OUTSIDE ASPECT OF THE CHORION WITH VILLI (a).

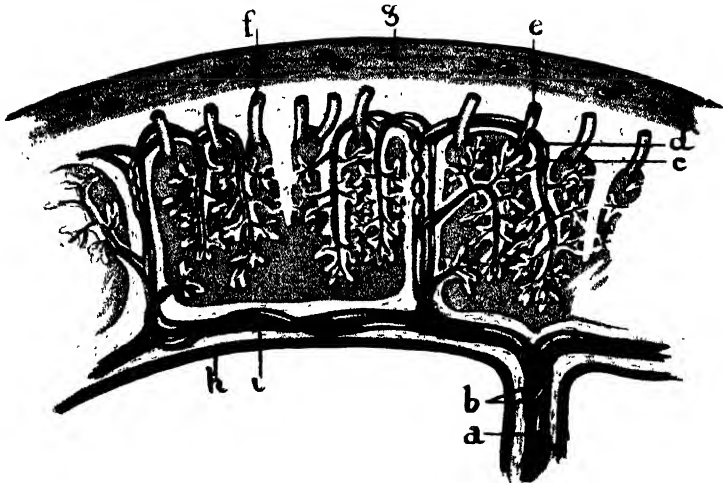
membrane—the amnion; the function of this membrane is to provide amniotic fluid, which constantly bathes and keeps the suspended foetus in equilibrium. So far as the tag is concerned, this daily becomes stronger and more prominent; it is indeed destined to be the umbilical cord, conveying blood from the mother to the child and vice versa.

The Placenta.—There is always great interest shown in the placenta; this structure develops with the foetus, is passed from the uterus at the end of childbirth and is then carefully dealt with, but it is useless once it has been delivered and it is destroyed. The fact is that the placenta is the clearing house in the route taken by the maternal blood and the foetal blood; by its presence the constant supply of nourishment for the foetus is assured while the waste products of foetal metabolism are transported to the maternal circulation and dealt with there. The now-specialized chorionic villi rooted in the basal decidua undergo rapid development. There is multiple branching and enlargement—the roots of the tree have grown, as well as the stem of the tree itself (umbilical cord). The function of the villi is now clear: to absorb by



EMBEDDING OF THE OVUM

a. Embryo. *b.* Compact layer of endometrium. *c.* Uterine muscle.
d. Uterine cavity. *e.* Decidua capsularis. *f.* Decidua basalis
 (Semi-diagrammatic.)



PLACENTA AT FULL TIME

a. Umbilical vein. *b.* Umbilical arteries. *c.* Umbilical artery branching
 in a villus. *d.* Umbilical vein branching in a villus. *e.* Uterine sinus in
 association with maternal vein. *f.* Uterine sinus in association with maternal
 artery. *g.* Uterine muscle (very vascular). *h.* Amnion. *i.* Chorion.

suction or other method the blood from the blood sinuses of the decidua and to fix the placenta firmly to the uterus. The nurse should clearly appreciate the fact that there is no actual tubular connexion between mother and child at this point. On account of this, we speak of the maternal circulation as running to and

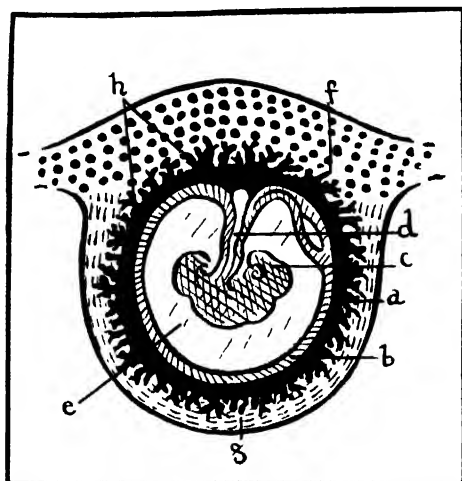


FIG. 142.—EARLY EMBRYO TO SHOW HOW FOETAL MEMBRANES ARISE (SEMI-DIAGRAMMATIC).

a, Chorion; *b*, Amnion; *c*, Foetus; *d*, First stage of umbilical cord formation; *e*, Amniotic fluid; *f*, Basal decidua; *g*, Capsular decidua; *h*, Villi on surface of chorion.

ending at the sinuses and of the foetal circulation as running from the embryo to the filaments of the short chorionic villi.

Subsequent development of the placenta is mainly that of bulk; it grows with the embryo and remains the intermediary of mother and child. The description of the full-time placenta is given more conveniently later.

Important Stages of Foetal Development.—In this brief summary of events of 9 critical months, documentary methods are impossible; only the salient points can be touched. The following stages are of importance.

At the end of the 3rd month.—The size of the embryo is about 4 inches, the weight 4 oz. Fingers and toes may be differentiated; there is evidence of bone; the torsion of the umbilical cord has begun.

At the end of the 6th month.—The foetus is 12 inches long and weight is about 2 lb. The skin has developed and the fine hairy covering can be seen (lanugo); the sexual organs can be differen-

tiated. The head is still much bigger than the rest of the body. The whole body is covered by a thin white paste of cheesy consistency; this paste is known as vernix caseosa and persists until birth. The foetus now takes up such a considerable space in the abdomen that the evidences externally are quite obvious; the bulk of the maternal abdomen increases rapidly as a rule.

After 30 weeks.—This is an important stage, for by the end of the 28th week the child is said to be viable—capable of living even although it may have a very feeble chance of survival. The hairy covering of the skin is now disappearing, in a male the testes have descended into the scrotum and the eyes may be seen, since the eyelids have separated. The foetus now weighs about $3\frac{1}{2}$ lb. and is 15 inches long.

At the end of the 9th month.—The full period of gestation (40 weeks or 280 days) having passed, it is now time for the birth of the child. For all practical purposes we may say that the development is complete; the length should be about 20 inches and the weight $6\frac{1}{2}$ to 7 lb. Males are usually heavier than females. The nails extend to the tips of the fingers. As in the case of the placenta the description of the child immediately after birth must be deferred until later on.

Clinical Picture of Pregnancy

It has already been said that pregnancy is a normal physiological state, but the changes that occur in the pregnant mother amount to what might be termed temporary abnormalities. In the accommodative reactions of the body, material and physiological adjustments have to be made. In effect the pattern of life, in all its aspects, is one which is distinct from that of the non-pregnant state, and the diagnosis of pregnancy amounts to a summary and description of all the features that comprise the condition. In the following pages, therefore, the main symptoms and signs are dealt with briefly and with the amount of emphasis required for each one. The nurse should be able to recognize these features. It is essential also to keep in mind that there are symptoms and signs of abnormal pregnancy which are in quite a different category; these are mentioned later on.

There are symptoms belonging almost to every day of the 280 days and there are associated signs too. In any attempt to make a categorical list it is advisable to relate symptoms and signs to the part of the period of pregnancy concerned; thus a beginning may be made with the first evidences and the whole story may then be told in natural sequence until the child is born.

Early Symptoms and Signs.—With a knowledge of embryology, it is possible to understand clearly why physiological adjustments should begin very soon after the zygote is formed, but

the time taken to translate such changes into terms of what the patient feels and what the observer discovers is variable. Very few women can tell whether they are pregnant or not in the first few days after fertilization; some have uncanny instincts, but apart from those specially endowed a big percentage of pregnant women are unable to be certain of their state until the date of the next expected menstrual period has passed. Amenorrhoea in a previously menstrually regular married woman is a very strong pointer to pregnancy.

Amenorrhoea.—In the investigation of possible pregnancy, early diagnosis is based on sudden stoppage of the menses; the menstrual period is generally reported on as having been expected on a certain day and not having occurred. There may be a few mild symptoms such as headache, colic and so on, but the main and outstanding feature of amenorrhoea is that it is the sign that sends the patient to the doctor or midwife. There is no need to discuss here the possibilities of pregnancy as based on dates of sexual intercourse. The only simple and practical way to investigate the case is to find out the date of the last menstrual period and to calculate from the first day of that epoch the expected date of the confinement, 280 days being the length of the average period of pregnancy. Many married women with several children do not keep a note of the dates of their menstruation. In the case of the first pregnancy, however, it is as a rule easy to ascertain when the last period occurred. There are 2 pitfalls in using the missed period as a sign of pregnancy or as a datum line from which to calculate the date of parturition. First there may have been illness (especially anaemia) with correlated irregular and scanty menstruation. Secondly, the age of the patient may cause difficulties: women over 40 years of age and pregnant for the first time may give a history of irregularity lasting for a year; mothers who are over 40 and who have had several children may approach the menopause with signs of irregular and scanty menstruation, and pregnancy may occur without the production of any specific reaction.

Abnormal Menstruation.—In contrast to what has been said above, there is the case of the woman who may have become pregnant and who under superficial investigation may yet declare that she has never missed a menstrual period. When there is any blood-stained vaginal discharge great complexities are introduced; furthermore it is possible to have some pseudo-menstruation on the exact days of the expected period. In the latter case the investigator has to make sure that the term, menstruation, is used strictly in its right sense, for investigation may prove that some other condition has been mistaken for menstruation. There is little or no doubt after the 3rd month because by then the embryo has fully occupied the uterine cavity. Previously,

however, the decidua vera on the non-occupied wall of the uterus may have been weak and may have been partially shed; another possibility is that a slight discharge may occur when the pressure of the embryo on the decidua is accentuated by the rising of the uterus above the level of the pelvic brim. It will be clear from what has been said above that in a certain percentage of cases it is advisable to make the fullest investigation before coming to the decision that true amenorrhoea is in existence. Diseases such as anaemia, renal disease, phthisis, glandular enlargements, endocrine disorders, anxiety states, hysteria and many others all must be borne in mind in the diagnosis. One other possibility may be considered: pregnancy in the nursing mother. Many women continue to suckle their babies in the belief that because amenorrhoea is thus maintained, they will not become pregnant. But pregnancy is possible and does occur, and great difficulty is thus experienced in fixing the true dates.

Morning Sickness.—Since about half the number of pregnant women suffer from morning sickness and since it is a symptom to be found roughly from the 40th day of pregnancy to the end of the 14th week, considerable importance is attached to its occurrence. Morning sickness amounts to a varying degree of nausea on rising in the morning. As a rule it passes off quickly and is a minor event in the daily round. Occasionally a small amount of bile-stained vomitus may be brought up, and the reactions with regard to lack of appetite, discomfort, retching and dizziness vary according to the individual concerned. It is agreed that morning sickness has strong psychological associations and the signs and symptoms which go with it depend very much upon the personality of the patient; nurses must therefore be prepared to meet with a variable pattern. In the majority of cases morning sickness is a minor epoch of pregnancy, expected and tolerated as inevitable and forgotten very quickly. Sometimes morning sickness does not pass off until after breakfast, and there is no doubt that fear and anxiety accentuate the condition. It must always be assessed at its proper value, and most important of all, carefully distinguished from pathological vomiting of pregnancy, which is discussed later and which is characterized by rejection of food and by other unmistakable evidences of the condition. To sum up, we may take it that morning sickness is an almost certain symptom of early pregnancy and that it is more of an interesting discomfort (in many cases welcomed by the pregnant woman because it removes all doubts of the condition) than an ailment.

Bladder Irritability.—Frequency of micturition is a common symptom during the first 3 months, small quantities of urine being passed often at hourly intervals; it is more annoying than discomforting to the pregnant woman, since it limits her outside activities. After the 3rd month has ended the irritability passes

off, and the reason is not difficult to find when it is remembered that the bladder is closely incorporated in the anterior vaginal wall; the uterus in its daily growth seeks to rise from the pelvic cavity and become temporarily an abdominal organ and in so doing pulls on the bladder ties, so that there is recurrent stimulation of the sensitive bladder, with consequent desire to pass urine.

Early Signs.—In the first month of pregnancy, apart from softening of the cervix and of the pelvic ligaments—both of which require skilled medical diagnosis—the only suggestive signs likely to be observed by the nurse are increases of the vaginal and cervical secretions. As time goes on, there are very distinct changes in the breasts, however, these following a short period during which the expectant mother has had a sense of undue fullness of the breasts amounting to discomfort or even pain. Careful examination of the breasts in the first few weeks would generally show that not only was there fullness, but a certain marbling of the stretched skin, caused by distension of the superficial veins; as a rule the enlarged veins show greatest prominence in lines radiating from the nipple. Very soon after the first appearance of this sign there are very clear indications in the region of the nipples. No matter whether the nipple may have been very small or more than usually prominent, it becomes unmistakably enlarged, this enlargement being accentuated by the increase of pigment, the normal pink coloration being replaced by a degree of brown which may be extremely dark in brunettes. Very soon after the establishment of these changes it will be discovered that not only do the nipples become scaly and tender, but the areola, now extended and somewhat puffy in appearance, is studded with small papules, pink or light brown in colour; these are known as Montgomery's tubercles or follicles and they are a constant sign of pregnancy, especially in primigravidae (women pregnant for the first time). It must be emphasized here that certain breast changes, especially of the nipples, are permanent. It is thus easy to tell whether a non-pregnant woman has had a child; naturally however in a multipara, nipple conditions in pregnancy do not give the same diagnostic information as they do in a primigravida.

Depending a good deal on the complexion of the woman concerned, there are also signs of pigmentation of the face; this may not be very noticeable in blonde women, but careful observation in brunettes will almost invariably result in discovery of patches of yellowish-brown pigment on the lower eyelids, at the sides of the nose and on the upper lip. These colorations however are not permanent as a rule.

A very important and interesting sign is to be observed after the middle of the 3rd month. It is known as uterine soufflé and is caused by enlargement of the uterine arteries which are

situated on either side of the uterus. The doctor or midwife may use the single wooden stethoscope, but as time goes on such instrument of amplification will not be necessary, for the blowing sound, heard regularly after each pulse beat, can be clearly demonstrated by laying a handkerchief or piece of gauze on the abdomen and applying the ear directly to the areas concerned.

Symptoms and Signs of the Middle Period.—It has been already stated that owing to the complex way in which events take place, it is by no means easy to divide the 40 weeks of pregnancy into periods. Nevertheless, the first 3 months, with the characteristic happenings described above, can be regarded as a phase more or less separated from the period of the 4th to 6th month of pregnancy. In this period probably the most characteristic piece of evidence is that in the 4th month the uterus becomes an abdominal organ, and from about the 12th week the state of pregnancy can be confirmed by actually seeing or at least feeling the swelling caused by the enlarging womb, now clearly rising out of the pelvic cup.

The Abdomen.—Abdominal examinations are made all through the period of pregnancy, and although these are the province of the doctor and midwife rather than of the nurse, it is essential that the nurse should know about the main points in abdominal examination. The illustrations (Figs. 143, 144) show in diagrammatic form the levels reached by the womb from the 3rd month onwards. There is no need to stress the importance of careful checking of the growth of the uterus; considerable importance is attached to the height of the fundus at various months. It will be noted that the uterus falls in the 9th month; the reasons will be given later, but so far as the period covered by the 3rd to 6th month is concerned there is a steady rise until at the 6th month the upper level of the uterus has reached the plane of the umbilicus or thereabout.

The routine examination of the abdomen as conducted by the doctor or midwife consists in inspection, palpation, percussion and auscultation, with the emphasis usually on palpation. By the last method, which confirms inspection, the womb can be observed to be enlarging both upwards and in lateral directions. At the 14th week of pregnancy the fundus should be about halfway between the umbilicus and the symphysis pubis. As mentioned above, the fundus should be level with the plane of the umbilicus at the 24th week. Examination by the 4 methods stated will generally show whether there is any abnormality of position or unusual outline (e.g. in twin pregnancy) and the possibility of a tumour or tumours should be kept in mind. One point to be remembered is that the uterus does not occupy a strictly central position in the abdomen; the "lie" of the uterus, as it is termed, is slightly towards the right side and there is a certain amount of

twisting of the axis, so that the left ovary is pulled slightly forwards, whereas the right ovary is buried more deeply. Apart from such deviations, there may be unusually great bulk of the uterus as a result of excess of amniotic fluid (a condition known as hydramnios), of distension of the bladder or of new growths.

The Linea Nigra.—Pigmentary changes belonging to the early part of the era have been discussed. Yet another sign is prominent, generally becoming clearly defined about the end of the 4th month. A thin line of pigment is to be observed running from the symphysis pubis to the umbilicus; as in other pigmentary conditions, the linea nigra is more clearly demonstrated in women of dark complexion; it fades after pregnancy in certain types of fair-haired women, but in the darker types it tends to remain, however faint the line may be.

Painless Uterine Contractions.—As a result of careful palpation of the abdomen—and sometimes indeed of close inspection—it is possible to determine the occurrence of painless uterine contractions. This phenomenon is observable in the 5th month of pregnancy. It is easily explained: the uterine muscle, now much increased, is subjected to waves of contraction which change the rubber-like fleshy mass into something of more definite consistency, the process going on rhythmically. Palpation by the open hands may set up these contractions, which may give rise to complementary waves on the surface of the abdomen. Incidentally in examining for painless uterine contractions it is convenient to find whether or not there are any abnormalities such as tumours, and in some cases the position of the foetus in the uterus may be determined.

Secondary Areola.—The initial changes in the region of the nipple are further added to as time goes on, so that at the end of the 5th month a secondary areola is well established. The breasts are gradually developing in size and Montgomery's tubercles are prominently displayed, standing out as they do as faintly pink structures, the contrast with the primary areola being very marked. It is believed that these tubercles are associated with the extra supply of sebaceous lubricating secretion required by the nipple. So far as the secondary areola is concerned this is shown as an outer belt of the primary areola; the base is white, but mottled patches and thin brown lines give the impression produced by the first rain drops of a shower falling on a dusty pavement. Ultimately the primary and secondary areolas appear to be so closely inter-related that it is difficult to say where the borderline runs.

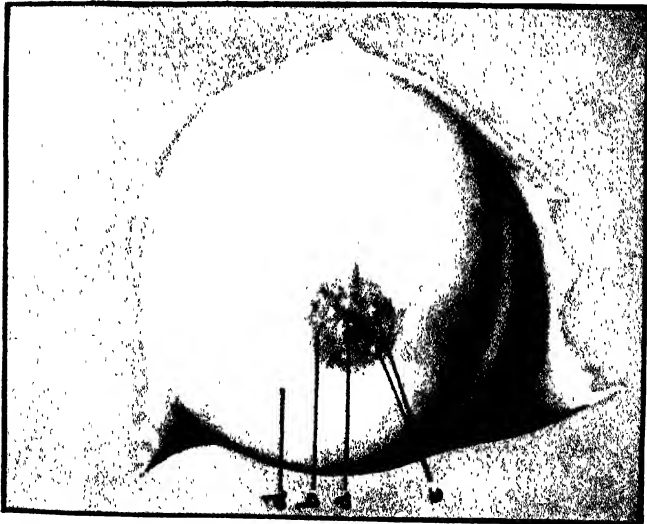
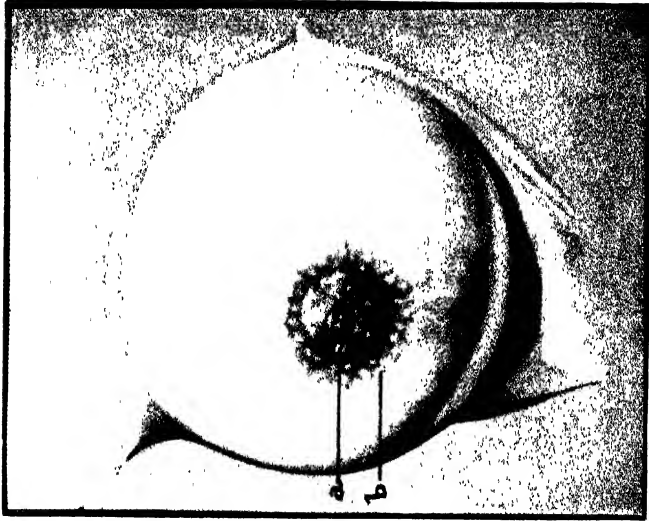
Foetal Movements.—Abdominal movements discussed above are associated with uterine muscular irritability; these movements must not be confused either with the artificial setting up of movement of the foetus suspended in the liquor amnii

(ballottement—see below) or with the autogenous movements of the foetus perceived by the mother and known as quickening. The latter is a symptom eagerly awaited by the mother, the first movement being hailed as a definite indication of a healthy child. These movements, generally spoken of as mild to moderate “kicks” within the uterine cavity, occur at any time and have been known to rouse the expectant mother from her sleep. They are generally most perceptible when the mother sits down and relaxes. Quickening may be observed as early as the 20th week of pregnancy, that is to say it marks the middle point of the 9-month period and is spoken of as “life.” The multipara has little difficulty in recognizing the symptom, but the primigravida may consider it to be increased peristalsis of the bowel in the early incidents; to begin with it may amount to no greater disturbance than that which might be caused by the fluttering wings of a small bird, but in a week or two there can be no mistaking the evidence.

External Ballottement.—This is caused by the tossing about of the foetus in the liquor amnii; if a small barrel were floated in a pond and controlled by a cord, similar splashings could be produced by the hands. It should be clearly understood that it is always necessary to set up ballottement, and this distinguishes it unmistakably from quickening, which goes on free of external control. Usually ballottement can be demonstrated at the end of the 20th week of pregnancy, and for some time afterwards, but gradually as a result of the growth of the foetus and the lack of increase of the liquor amnii, the foetal movements are very much reduced and external ballottement becomes very restricted. In order to demonstrate the sign, the nurse should fix the right side of the uterus by laying her hand along its border and pressing fairly strongly on the abdominal wall. The left hand is made into a small cone by approximating the tips of the thumb and index and middle fingers; a succession of taps is made on the left side of the uterus; at intervals it will be noted that the fluid is displaced and as a result the foetal body will be felt. This is all the more remarkable in view of the amount of abdominal and uterine muscle which intervenes.

Symptoms and Signs of the Last Period.—The growth to maturity of the foetus is rapid in the last 3 months (or 13 to 14 weeks) of pregnancy. The only symptom, apart from the various minor reactions associated with the condition, is amenorrhoea, which persists for some variable time after the birth of the child. There are certain signs which may now be considered.

The Breasts.—With the approach of full term and of the need for the provision of milk for the offspring, the breasts become organized for their important function. It will be noted that the nipples and areolas appear to constitute one unit, admirably



THE BREAST IN PREGNANCY

Left.—Breast at 10th week.—*a*, Nipple. *b*, Primary areola. *c*, Montgomery's tubercles. *d*, Distended veins.
Right.—Breast at 26th week.—*a*, Montgomery's tubercle. *b*, Secondary areola.

suited for their job. The glands themselves are firm and obviously of considerable tension; even the mammary lobules can be made out on palpation. Small pink striated lines may also be observed to radiate from the upper half of the areola in the direction of the periphery of the breast. It need hardly be mentioned here that the breasts in the period just before parturition are very easily injured; the greatest care should be taken (as mentioned later) to ensure that no damage is done. Palpation should be done with extreme gentleness. It is usually possible to express a little clear secretion from the nipple from the 4th month onwards; this is done by carefully pressing on the gland with the hands, one on

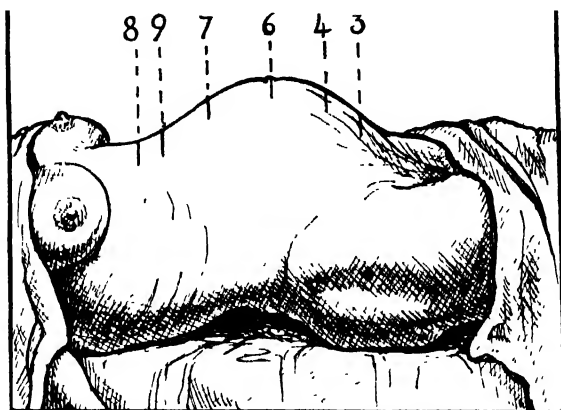


FIG. 143.—DEVELOPMENT OF THE FORTUS.

Levels of the fundus uteri at various months as indicated by numbers. Side view.

either side. It is not advisable to make this test as a matter of sheer curiosity, and some authorities believe that the breasts should not be tampered with. In any case when the date of the confinement draws near, it may be possible to observe a bead of rather sticky yellowish fluid which has been expressed by the ordinary activities of the expectant mother; this is the substance, colostrum, which is the forerunner of the true milk and which is in fully supply for the first 24 hours after confinement.

The Uterus.—As shown in the illustrations (Figs. 143, 144) the level of the fundus steadily rises in the last 3 calendar months. At the end of the 28th week it should be about $2\frac{1}{2}$ inches above the level of the umbilicus, which incidentally has now become much more prominent and even everted. By the end of the 32nd week the fundus has reached a level midway between the tip of the sternum and the umbilicus. By the end of the 36th week the level is very close to a line passing horizontally through the tip of

the sternum. It is at this stage that the abdomen appears to be at its maximum, and many lay persons are apt to think that miscalculations have been made and that the confinement may be expected sooner than the calculations may have determined. External ballottement is almost nil. In the last 4 weeks of pregnancy, however, the uterus descends, i.e. the presenting part

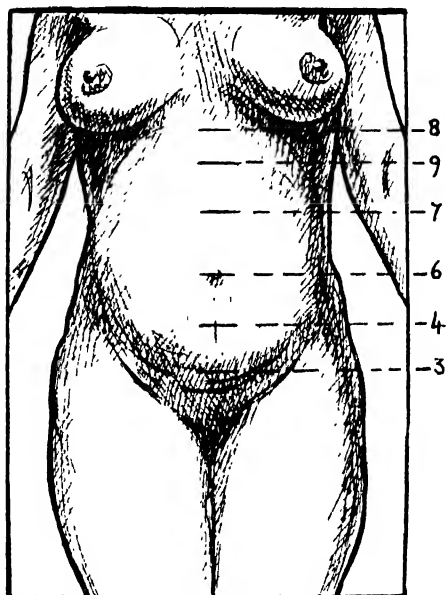


FIG. 141.—DEVELOPMENT OF THE FOETUS.

To show upper levels of the fundus uteri according to the months as indicated by numbers. Front view.

(generally the head) begins to find its way into the cavity of the pelvis. The intra-abdominal strain therefore becomes lessened and the height of the fundus is clearly reduced—the level is well below the tip of the sternum. This process is commonly referred to as lightening. The weight of the uterus at full term is about 2 lb. and its length is over 12 inches; the width is 9 inches and the capacity is about 4 quarts. Add to this that the uterine contents must be in the region of 7 lb. and that increase of muscle, connective tissue, ligaments and blood vessels adds to the weight, and it will be obvious that the best use has been made of the space available.

Striae Gravidarum.—At this point it is convenient to refer to a condition of the skin which is caused by pregnancy and which

persists in almost every case for the rest of the life of the mother. The occurrence of *striae gravidarum* on the abdominal wall, quite apart from the wrinkled state of the skin, is a lasting reminder of the strain which has been put on the skin. The latter has a considerable elasticity, and thus skin can stretch fairly well. When the child is of even normal proportions there is a great amount of strain put on the subcuticular layers of the skin, and first pink then blue streaks appear all over, the result of rupture of various tissues, including blood vessels. The same thing can happen in the case of massive abdominal tumour not associated with pregnancy, but the presence of the white, cicatricial remnants of the strain—the true *striae gravidarum*—in a woman who has had one or more children is typical of motherhood. In fact the presence of *striae gravidarum* in routine abdominal examination is in almost every instance taken as a proof of former pregnancy, unless there is a history of former abdominal tumour or other similar state.

Diagnostic Tests for Pregnancy

The increased understanding of the action of the endocrine glands and the great perfection attained in radiology are two very important factors in the diagnosis of pregnancy, one biological, the other physical.

Biological Tests.—The association of alteration of endocrine gland activity with the state of pregnancy is already well known to all in the medical world. It is not difficult, with the many facts clear in our minds, to understand that hormonal tests are the logical outcome of increased knowledge of the mechanism of endocrine action. There are 2 accepted tests for pregnancy—that of Aschheim and Zondek and that of Friedmann. Both depend upon the fact that prolactin, generated by the placenta, is to be found in the urine of the pregnant woman. Prolactin (chorionic gonadotrophin) can be injected into immature female mice as it is to be found in the urine, without any previous treatment. This is typical of the Aschheim-Zondek test. A fresh morning specimen of urine can be used; the mice respond to the hormones now amply provided, 1. by showing a ripening of the graafian follicles and the start of oestrus; 2. by having small punctate haemorrhages in the ovary; 3. by forming corpora lutea. The woman considered to be pregnant can therefore be reassured. The test can be carried out very early in pregnancy and a diagnosis of the condition can be confirmed from about the 8th week onwards. The Aschheim-Zondek test takes about 4 days for its completion.

So far as the Friedmann test is concerned, the difference is that rabbits are used instead of mice. Based on the knowledge that

the female rabbit does not ovulate unless copulation has occurred, the Friedmann test is carried out by injecting about 5 ccm. of morning urine into the ear of a rabbit which has reached the age of 4 months and which has been kept away from all other rabbits for a month. It may be necessary to repeat the injection after 12 hours, but as a rule the positive signs are soon demonstrated, i.e. examination of the ovaries of the anaesthetized rabbit shows the existence of haemorrhagic follicles and beginnings of corpora lutea. Certain types of toad may also be used (*Xenopus* toad) since they begin to show reactions in positive cases in 8 to 16 hours.

Radiological Tests.—From the 16th week it is possible to prove by x-ray examination that pregnancy is in being, although it may not be possible to say whether the foetus is alive or dead; a further examination about 4 weeks later will, however, put all doubts at rest when it can be shown that the foetal frame has in fact developed. So far as progress in pregnancy is concerned, x-ray examination is not of paramount importance. Sometimes indeed radiological examination is made difficult, if not unsuitable, by the obesity of the mother. A great deal depends upon the efficiency of the apparatus used. Perhaps the most important time at which radiology is of value is during the period just before the child is born. Then it can be ascertained whether the attitude and presentation are normal, what abnormalities (if any) are to be found in the pelvis, whether there are monsters or a state of unduly large head (hydrocephalus), whether a single or multiple pregnancy is in existence and various other items of information most important to the obstetrician.

Postmaturity

Before anything may be said about postmaturity, it is advisable to define the condition accurately, because certain important medico-legal problems may arise, associated with the legitimacy of the child and so on. It is known that pregnancy may go on for 300 days or longer, but as a rule in any case in which more than 280 days have elapsed since the first day of the last menstrual period, the diagnosis of postmaturity may be made. The difficulties must already be clear to those who have read the preceding pages of this chapter, for definite calculation is often impossible, and all general practitioners and midwives in active practice will agree that dates fixed several months previously are often proved to be wrong in the event. Thus most doctors are in the habit of keeping an open mind, especially in the case of the primipara, about confinements that are a week early or a week late, as the case may be.

When, however, there is no doubt as to true postmaturity, many problems arise, and assuming that all factors (obstruction,



FIG. 145.—X-RAY OF PREGNANCY NEAR TERM.

(By courtesy of the Medical Superintendent, Queen Mary's Hospital for Children, Carshalton.)

faults in the foetus, faults in the pelvic frame and so on) likely to delay birth have been eliminated, and when the idiosyncrasy of the mother has been taken into account too, it may be concluded that a true state of postmaturity is in existence. The causes are doubtful, but when it is remembered that pregnancy is controlled to a large extent by hormonal action it must be allowed that progress may be hindered at one stage or another by defective or abnormal endocrine supply. The practical points to be kept in mind are that even in undoubted postmaturity normal birth may occur, that by various methods labour may be brought on (induction), and that it is rare to allow the mother in true cases of postmaturity to go more than 14 days beyond the normal 280 days.

Pseudocyesis

There is a Hibernian flavour in the statement that pseudocyesis is one of the signs of pregnancy, since the term is used to describe a condition which is in fact the very opposite. Nevertheless it is advisable to bring the subject within the province of diagnosis of pregnancy, since it is a possibility always to be considered when examination does not confirm in any particular the suggestive symptoms complained of. Pseudocyesis is in fact a matter for serious attitude on the part of the doctor, and must be regarded as a disease—psychological it is true—based on certain abnormalities. The latter take the form of frustration maybe, with subsequent wishful thinking amounting to belief that pregnancy is a reality. Every possible effort is made by the patient to simulate physically the pregnant state; she will even go as far as to protrude the abdomen and generally to give herself the appearance of being pregnant. Needless to say, modern psychological methods can quickly bring an end to the erroneous belief. Formerly it was customary to administer a small amount of chloroform, the evidence of a reliable female witness being accepted as correct: invariably the abdomen became flattened and all suggestions of pregnancy were removed. This was told to the patient by the impartial observer. The practical point about pseudocyesis is that it must not be dismissed lightly: it is a serious matter for the patient, who really believes herself to be pregnant, and the greatest care must be taken to ensure that the cure is complete. It needs no stretch of the imagination to agree that the most satisfactory cure would be brought about by the occurrence of true pregnancy.

Systemic Reactions in Pregnancy

The emphasis put on the normality of pregnancy must not blind us to the fact that although what is happening in the repro-

ductive system is a natural physiological event, certain reciprocal actions must occur in the various other systems of the body. Again it is a matter of physiological adjustment, but such adjustment is great enough to demonstrate itself to the examiner. One point must be made clear before a review of the body is held: it is possible to have pregnancy in a woman who has some pathological state of an organ or organs. In fact in a multipara it is probably a rarity to find complete absence of signs of defect in one or other of the various systems. In the conditions discussed below, only physiological (functional) changes are dealt with; such changes are of course temporary and take place in order that the whole body may react as one unit, in sympathy with the state of pregnancy. For instance in making the general survey of the body—which is always essential—the nurse will discover that the general metabolism of the body is speeded up, that circulation is generally increased to deal effectively with the increased volume of the blood and with the needs of the foetus, that appetite and digestion reach a degree far beyond that of the normal level. These and many other symptoms and signs are to be expected.

The Skin.—The external examination presumably starts with the skin. Here the pigmentation already referred to will be obvious on the face, abdomen, breasts and vulva. Prominent irregular lines of pigmentation may be observed in the axilla and groin. Furthermore, certain types of woman become darker in complexion all over, indicative of some general reaction to conform with the main plan of pregnancy.

Circulation.—The patient herself is aware of the increase of activity, for she will almost invariably volunteer the information that not only does she pass urine more frequently but she also passes considerable quantities per day. This is very important. The pulse may be slightly quickened. The heart itself makes a special effort to distribute the maximal quantity of blood. So far as external signs are concerned, it is pressure internally that sets up evidences too obvious to be missed; the mother will almost certainly point out various signs to the nurse, if indeed the nurse has not herself seen the picture—varicose veins, swelling of the feet, especially in the evenings or after prolonged standing, congestion of the vulvar parts and last but not least occurrence of piles. All these signs have a meaning and all can be dealt with effectively. Wearing of elastic stockings, resting for periods, avoidance of constipation and application of local soothing remedies may all assist in the alleviation of the condition, which, let us not forget, may change from time to time, just as the size, position and pressure of the foetus may alter inside the uterus.

Digestion.—The occurrence of morning sickness may well be left out of this category, especially when it is regarded as of

psychological rather than purely physical importance. One very common complaint of pregnant women is, however, that of "heartburn"—that is to say hyperchlorhydria or excess of hydrochloric acid in the stomach. It is not difficult to imagine why this symptom should manifest itself as the main alimentary grievance in the pregnant woman; it is merely the end-product of ever-changing metabolism, sometimes the result of sudden foetal progress, sometimes the reaction to unsuitable food, sometimes even the normal sequel to an overloaded stomach, this caused by over-eating and the general effects of the voracious appetite so commonly found. Nowadays there is not so much belief in the feeding up of the mother with extra meat, even when the latter is available, and a better educated populace knows that too much meat is productive of excess of urea, whereas carbohydrates, with ample vitamin B, are a surety against acidosis. The diet of the pregnant woman is referred to in Volume III of this work (Section VIII) and no more may be said here than that a satisfactorily balanced diet with all necessary constituents is in normal cases to be advised.

Constipation.—Associated with digestion is faecal excretion and here once more natural evacuation is to be hoped for. But sometimes, as a result of mechanical obstruction (see above) there is difficulty in bowel evacuation. In such cases the warning must be given first and foremost against the drastic purges; what is required is the gentle aperient or the mild laxative—liquid paraffin, elixir of cascara, senna in different preparations.

Nervous Changes.—Many pregnant women in the later stages complain of cramp in the legs; this is the result of pressure on the main nerves and the effects are experienced in the lower distribution. As a general rule there are complaints of a sensation of "toothache" of the legs, especially after long standing. The cause, generally speaking, is irritation of the nerves and the effects may be demonstrated as neuralgia in the pelvic region and sacrum, sciatica affecting the hips and the back of the thighs and various other pains.

Psychological Changes.—These will be investigated by the nurse whose sympathetic ear is open to the more personal complaints of the pregnant woman. The sleeplessness of the expectant mother is often to be explained by anxiety rather than by the physical changes, and the nurse may be able to effect a speedy cure by dispelling any fears present in the patient's mind; it is an important point. It has to be remembered that the temporary disruption of ordinary living, the constant changes, the occurrence of new and unexplained feelings and the whole atmosphere of domestic tension have an effect on the pregnant woman and cause her discomfort. Sympathetic response by the nurse may

work wonders. Of importance too from the psychological point of view is perversion of appetite; it is a well-known phenomenon of pregnancy and is of long history. It is difficult to explain, although it may be observed in animals. The desire may be for inordinate quantities of the usual items of the dietary or for one particular and generally unobtainable commodity. Again the mother to be may have the craving for certain inedible substances; in this case the specialist's advice should be helpful. What might be termed the more objective nervous symptoms are for instance attacks of lightheadedness, the dizziness coming on suddenly and occasionally resulting in short-lived "black-outs"; this is peculiar to the more highly strung type of woman. The short-lived flushes and temporary rashes which cause some worry generally disappear before real anxiety develops; these have origin in the autonomic nervous system and are to be expected, since there is close association of the latter with the endocrine system. Mention should also be made of the muscular weakness and softening which may be so serious as to prevent the mother from walking for some time. It is likely that there is a primary nerve starvation here, temporary indeed but sufficient to interrupt the important metabolic activities of the muscle cells.

Urinary System.—Although the custom of examination of the urine at various stages of pregnancy has been long in vogue, it was not always a hygienic procedure. Sources of contamination were the woman herself and the container into which the urine was passed, not to speak of the vehicle in which the specimen was conveyed to the doctor—generally an improperly rinsed 6 oz. medicine bottle. The ideal method of urine collection, impossible as a rule domestically, is catheterization, with reception into a sterilized container. Otherwise by use of special containers (referred to already in Vol. II, Section IV) a reasonably pure specimen of urine may be obtained. The tests can then be carried out as described already in this work. In cases in which a 24-hour specimen is required, the patient must be instructed how to cleanse the vulva before micturition, and also how to sterilize and use the glass jam jar which serves the purpose of receptacle admirably. It should be ascertained that the bladder is empty before the beginning of the 24-hour test period. At the end of this period the total quantity may be measured. So far as the ordinary testing specimen is concerned, it is best to have a morning specimen.

CHAPTER 2

ANTENATAL CARE

GENERAL PRINCIPLES. FUNDAMENTALS. ANTENATAL ROUTINE. HYGIENE IN THE PRENATAL PHASE. PLANNING FOR THE CONFINEMENT IN THE HOME. CONFINEMENT IN THE HOSPITAL.

ANTENATAL care had its origin in the realization by all associated with obstetrics that many of the complications of pregnancy, child-birth and the puerperium and threats to the life of the mother or the infant were the result of lack of proper attention to the health of the expectant mother. The natural phenomenon of child-birth becomes threatened in its every aspect by civilization and all that goes with it; the policy of *laissez-aller* may have been right in natural surroundings, but with modern ways of life it is clear that practical application of hygienic principles is an essential. The proof of any policy is achievement: the steadily declining infantile death rate and the lowering of the maternal mortality figures are ample evidence of the success of the now universally accepted principles that govern supervision and treatment of the pregnant woman almost from the day of conception. A few of these principles are discussed below, but it will be realized by all nurses that it is not possible to go far beyond the main outlines of the subject in this work. The management of pregnancy, which may be said to be the most comprehensive application of the principles of antenatal care, includes many items concerning the health of the mother-to-be, the observation of the foetus, the control of any intercurrent disease, the psychological and physical adjustment of the patient to her ever-changing environment and the treatment of all the ailments intrinsic to the state of pregnancy. Antenatal care may be applied in varying degree—extensively or with certain restriction—depending upon the doctor in charge of the case. It is true that certain women require to have a greater amount of antenatal care than others. /

General Principles

Ordinary hygienic rules, applied judiciously and modified according to the special case under consideration, will in general

be effective guiding lines for the nurse who seeks to formulate a scheme of antenatal supervision and care. No two patients are the same and adjustments have to be made for individual peculiarity and for personal constitution. The Public Health Authority, whether it be represented by the doctor or the midwife or the whole machinery of the Child Welfare Centre itself, undertakes to give the maximum of help to those who require it, and thus the midwife may have to make a very close study of her patient. Subjects such as mental make-up, psychological reaction to pregnancy, the general physique of the patient, the domestic surroundings, the personal habits of the patient, exercise, rest, diet, clothing, sleep, care of the skin, mouth, teeth, breasts, alimentary system, circulatory system and urinary system, must all be considered and the patient must be constantly kept in a state of preparedness for the event which lies ahead. (See also Section XIV.)

From the above it will be clear that the aim and object of antenatal care is to discover everything of note in the expectant mother and to guide her through the 40 weeks' ordeal that may be her lot. Supervision of the kind nowadays in operation tends to discover the abnormality at the earliest possible moment and to arrange for its elimination if possible; furthermore, the confidence of the patient having been gained by the nurse there is every likelihood that the latter will be consulted on every point arising out of the events of the 40 weeks, and so will be able to decide which are normal reactions and which come under the heading of abnormal.

Fundamentals.—Fairbairn has postulated 4 main fundamentals of antenatal care, these being: 1. maintenance of bodily and mental health during pregnancy; 2. preservation of pregnancy until the confinement takes place at full time; 3. foreseeing and averting of preventable difficulties and complications in labour and in the puerperium; 4. the securing of the best provision for labour, the preparation of the mother for the nursing and general care of her expected child and health education for the mother and for her family. Certain of these fundamentals may with advantage be discussed at this point, but much of what comes naturally into the ordinary routine of supervision and which has already been referred to in Chapter I may be omitted.

Antenatal Routine.—Assuming that the expectant mother discovers very early that she is pregnant and that she is alive to the possibilities of antenatal supervision, she will probably do one of 3 things: she will go to see her doctor, or failing that call in a midwife or present herself for investigation at one of the antenatal clinics. In any case, since the machinery exists and in good working order there is nowadays no possibility of the pregnant woman not having every available service under the many schemes for maternity and child welfare.

The Doctor.—The personal medical attendant generally goes into the history of the patient's health and of the existing pregnancy, making notes which may be of assistance to him later. A comprehensive physical examination is also made and the special investigation of any item carried out—for instance the urine is almost invariably examined. At the end of the examination the doctor will probably have satisfied himself on several points, e.g. the probability of a normal and uneventful pregnancy and confinement, the possibilities of complications, the dangers of intercurrent systemic disease, the influences likely to be exerted by already existing disease (such as valvular disease of the heart, tuberculosis and so on) and the general routine of supervision and help likely to be required in the case. Summing up the situation, the medical practitioner will almost certainly recommend the patient to engage a midwife, and very often one will be recommended; it is always more satisfactory from every point of view that a doctor and a midwife who know each other's methods thoroughly should work together. In this case, instructions will be given by the doctor to the midwife engaged for the case. From time to time the doctor will examine the patient; very often the whole programme of the pregnancy is worked out and doctor and midwife arrange to take charge of the patient so that she need have no worry. In the event of complications gradually or suddenly arising, and likely to interfere with the normal course of child-birth, the doctor will be prepared to take the necessary action, sometimes taking the drastic step of induction of labour when that emergency is called for. Antenatal treatment, however, resolves itself into constant supervision by the midwife, whose work may be taken as typical of the service given. In this chapter, therefore, only passing reference need be made to the activities of public health clinics, since the staff at these places, medical and nursing, gives advice and help similar to that to be obtained from the private doctor and midwife.

The Midwife's Duties.—Undoubtedly this subject is the one which the general nurse will find most interesting, since it is applicable in greater amount to her own professional work. The midwife's duties begin either when the patient calls her in or when the patient is referred to her by the doctor. Actually there is little or no difference in the work to be done, for reasons given above. Most of the subjects dealt with in Chapter 1 will come up for consideration. There is really no limit to the responsibilities of the midwife and the more time she can give to her patient the better. A word of warning must be given here, however: antenatal care must not become burdensome to the patient—the midwife must be alive always to the dangers of overdoing supervision and treatment. The fundamental principles at the base of antenatal care are as little as possible interference with the comfort

and serenity of the expectant mother. In fact the work of the midwife in the antenatal phase should be unobtrusive in every sense of the word; it is good for the patient that she should appreciate all the essentials of prenatal hygiene, but over-examination and constant reiteration of warnings tend to set up the anxiety neurosis or even frank fear of the event ahead. The successful midwife in the antenatal routine is the one who ascertains all the required facts but yet does so with the least encroachment on the patient's body and mind.

Needless to say, it will be imperative that abnormalities should be recognized and reported upon; careful note taking is also demanded. From time to time at least external examination may be called for and duly carried out. Any suspicious symptoms and signs should be brought to the notice of the supervising doctor especially when there is need for internal examination, and it is clearly the duty of the midwife in certain circumstances to obtain a negative decision.

Care in the First 3 Months.—History (family and personal), the existing condition and the circumstances of the patient having been assessed as referred to above, the case sheet begins to take shape. There is no need to go over old ground and discuss the possibilities of the case: anything mentioned in Chapter 1 may be intrinsic to the case now before the nurse. Some midwives have a system of checking which covers all the possibilities of the pregnant state, and in this way they ensure that they miss very little in their investigations. Calls may be made every fortnight or oftener if need be; at each visit any symptom is investigated and examination made when necessary. A check is made on the order of events and confirmatory measures taken to reassure the nurse and the patient of normal progress.

Care in the Last 6 Months.—As a rule the ailments of the first 3 months tend to be of neurotic type, but in the last 6 months the physical effects are outstanding and the reactions, already enumerated, to the rapidly increasing uterus and its contents, are indicative of the strain experienced by the patient. Apart from what might be termed the "normal" repercussions of pregnancy, there are complications which are set up by the state of pregnancy and which are of vital importance to all concerned. The expectant mother does not worry unduly about varicose veins or swollen feet or indeed the ponderous mass distorting her figure. But the nurse must clearly be ready to recognize the early signals of eclampsia (fits), albuminuria, toxic vomiting, dangerous anaemia, abnormal positions of the foetus and various other abnormalities. Furthermore, the mother to be is not generally aware of the possibilities of breast troubles, vaginal catarrh or bleeding piles: it is the midwife's job to assure herself that such conditions are either prevented or looked after when they may arise. Many a so-called

minor defect may pass unnoticed by the careless observer and on many occasions a septic tooth or ear or a condition of pruritus or eczema has set up mysterious signs and symptoms until it has been traced and dealt with.

The urine is especially important at all times; the occurrence of the slightest amounts of albumin, blood, sugar or pus should prompt the midwife to consult the doctor about it. Of all the routine investigations of pregnancy urine examination probably comes first in importance and value.

As the date of the confinement approaches, the upper level of the uterus falls and then it is possible to determine more or less accurately how the foetus is lying in the abdomen and how the presentation is to take effect. The speed of delivery of the child, however, can rarely be predicted by examination, since the state of the uterine muscle is the determining factor and since it is impossible to tell whether there is to be weak muscular action with poor effort—the condition known as uterine inertia—or unusually vigorous muscular contraction leading to precipitate labour. Notes can however be made on the subject of post-maturity and on any terminal abnormality of mother or foetus, especially the latter. The induction of labour before the end of the normal period is often the result of close observation by the nurse. So far as the operation of Caesarean section is concerned, however, as a general rule this is undertaken on account of pelvic narrowing and the condition may have been discovered early in pregnancy, or in the case of the multipara, at a previous pregnancy; the doctor will have made arrangements early in the pregnancy to have the operation performed at a suitable time; all preparations will therefore have been made.

Lastly there is the question of manipulation. As a result of the close observation kept on the patient, some slight maternal or foetal discrepancy may have been noted—e.g. the pelvis may be just too small or the foetus just too big. In such cases, the patient is usually admitted to hospital in the last fortnight of her pregnancy and kept under constant observation there. It may be that her confinement will pass off uneventfully, but if there should be any sign of likely difficulty, help can be given and any manipulative or instrumental interference made when such treatment is deemed to be necessary.

Hygiene in the Prenatal Phase.—The fundamentals of hygiene have been emphasized in this work in several places. At no period is hygienic care more to be desired than during pregnancy. It cannot be too often repeated that pregnancy should be regarded as a normal condition, therefore all the essentials of the healthy life—exercise, recreation, sleep, food supply, clothing and so on—should be provided. There is still a tendency, remaining like a memorial of black bad old days of the 19th century,

to coddle the woman who is pregnant; we see and hear people warning the pregnant woman to take care or to inhibit herself in her everyday life. Some women are unfortunately in a pathological state from the moment they become pregnant and others are made into psychoneurotics by misplaced sympathy and erroneously based principles. But the big majority of women are indeed happier and fitter when they are allowed to be free of restriction, and good hygiene will see to it that all unnecessary inhibition is prevented and that the pregnant woman is allowed to live her life to the full.

Exercise.—There is no reason why household work should not be undertaken by the pregnant woman. Always provided that domestic duties are not a drudgery and that the patient wants to carry on with her work, the exercise is very good for her. Of course there comes a time when help is needed and when for purely mechanical reasons restrictions have to be put on the daily round. For instance doing a heavy washing and carrying baskets of wet clothing are not to be advised in the last 3 months of pregnancy. On the other hand in certain industrial areas (in which for example women are employed as spinners or weavers) a pregnant woman will often keep on at her job until almost the last day and without any apparent discomfort or damage to her constitution. Most women are advised to go out every day, either for a walk or in order to do the family shopping; here again it is a matter of judicious limitation of effort, any extra strain being avoided. The playing of games such as golf or those involving less effort is to be encouraged, but tennis and hockey are not to be recommended. The criterion of safe and ample exercise is the condition of the patient afterwards; she is allowed to be healthily tired but on no account should there be any fatigue. Perhaps one of the most harmful occupations is that of standing about or of moving about in a very restricted space. No matter how a woman may spend her morning however, there is a generally accepted principle which governs rest; the pregnant woman should lie down for at least an hour in the mid-afternoon. Recreation in the form of reading and other sedentary occupations should be encouraged during this hour; there is no need to have sleep. As a general rule it is found that those who follow the above routine are free from piles, varicose veins and many other serious results of pressure.

A more modern development of the principle of exercise is that of rhythmic exercises performed daily and according to a fixed programme. These exercises are devised by experts and are generally supervised by a medical gymnast, e.g. a member of the Chartered Society of Physiotherapists. The average working woman cannot be expected to participate in what might be put down as luxury treatment, nevertheless for certain women who

for some reason require such exercises, the routine is most satisfactory.

Diet.—This subject, already dealt with at great length elsewhere in this work, may be dismissed in a few sentences. The principles which govern the dietary of the normally pregnant woman are those which maintain ample allowance of the usual items; it is unwise to devise any kind of special diet for the patient. There is a strong need, however, for ample supply of vitamins and mineral salts, and it should never be forgotten that the expectant mother need not be a glutton in order to keep up the supply of nourishment for the foetus. The practical aspects of the dietary must not be forgotten. Much depends upon the tastes of the patient for certain things. Meals may be given at more frequent intervals and should be well cooked and attractive. Plenty of time should be allowed and the atmosphere should be one of calm and freedom from anxiety. Special milk allowances and other dietary concessions ensure that the pregnant woman may have a substantial ration of the basic necessities and good supplies of brown bread, green vegetables, fruit and eggs. Cereals and especially oatmeal porridge are to be recommended, as well as fish. But there are certain forbidden things, amongst which are highly seasoned foods, pickles, other tinned foods, recooked dishes and alcohol. In the last 3 months of pregnancy meat should not be in excess; in a rationed community, however, there is no danger of this.

Sleep.—In many cases there is complaint not so much of absolute insomnia as of broken sleep, this being the result in a certain proportion of foetal movements and of palpitation. A good night's sleep is essential in order to ensure that the nervous system will have its proper amount of rest; fear and worry, when they are allowed to persist, may lead to serious psychoneurosis and the birth of a nervy child. The nurse can act the part of psychologist admirably, provided as she is with all the information of the more personal problems of her patient. As the time for the confinement draws nearer there is generally a complaint of much interruption of the sleep and restless nights. Every effort should be made to maintain quietude, but it is questionable whether or not darkening of the room is helpful. Many women have confessed that by escaping from the rest of the family and retiring early to listen to the radio they have been very satisfactorily prepared for the bodily relaxation that precedes the good sound sleep. In very obstinate cases, some sedative may be necessary, and when the doctor, who should always be referred to in these matters, does not consider that the ordinary sedative or hypnotic drug is to be advised, soothing drinks such as "Ovaltine" or malted milk may be provided. The value of gentle massage is acknowledged; this should be done after the patient has settled

down for the night and it may in certain cases be continued until sleep has taken firm hold of the patient. One physical cause of broken sleep is cramp of the muscles, and the pregnant woman should be warned of this and told how to deal with it; slapping of the affected muscles, extension of the limb, vigorous rubbing and kneading of the fibres all have good effect. Needless to say the causes of such attacks of cramp should be investigated.

Dress.—Physiologically and cosmetically, the clothes of the pregnant woman are of the greatest importance. The wearing of a corset can never be countenanced as a measure to conceal the bulging figure; fashion sways this way and that and the virtuous denial of the need for a corset associated with those who are now middle-aged is showing signs of weakening in order to conform to the fashion which affects those in their twenties today. A support for the abdomen and breasts of the pregnant woman is certainly required, but it should remain strictly a support, and it should do its work without causing either pain or feeling of restriction. The nipples should not be allowed to be flattened—this is most important. Any constriction round the waist should be avoided, as well as the wearing of elastic garters. The feet should be protected from cold and other influences by wearing medium woollen stockings and flat-heeled shoes about which elegance has not been the first consideration. The amount and style of clothing must always depend upon the patient who has her own whims and idiosyncrasies. Once the nurse has satisfied herself that warmth has been amply provided and that there is comfort without ugliness, she may be certain that her duty has been well done.

Occasionally a surgical belt may have to be worn on account of excessive weakness of the abdominal wall. This is typical of the multiparous woman. The doctor in charge generally arranges to have a special belt fitted and made; the midwife generally finds that it is her responsibility to see that the belt is put on properly and that it is given full scope to do the work intended for it. Abdominal belts must support without causing discomfort or pain; they are always uncomfortable at first but if the woman is encouraged and helped in the first week the rest of the period of wear will not give rise to any of these symptoms.

Planning for The Confinement

An aspect of antenatal care which is important and which demands imagination and common sense is the making of plans for the birth and for the period afterwards. Apart from its usefulness in the collection of necessary equipment, planning dispels that certain anxiety which afflicts any human being who does not know what is ahead or how the acts are to be accomplished. Very few mothers to be are not greatly interested in the equipment and

clothing of the expected child, and so far as the nurse is concerned she should see that the patient's interest is maintained right to the end of pregnancy. Needless to say, the midwife has to plan for certain events which do not require to command all the patient's interest; since all kinds of emergency have to be envisaged, equipment of purely professional type may at least have to be earmarked. But with regard to the infant's layette and the clothing, appliances and various other needs in which the patient is interested these should be brought into the programme and used as objects of what might be called domestic occupational therapy. The expectant mother will be much less introspective and much more satisfied when she knows she can use her needle and thread or even merely collect, classify and lay away the various articles required for the child and for herself. As might be expected the amount of equipment bought and laid by depends upon the social status of the patient. But nowadays even the poorest woman can be supplied by the Local Authority with the essential materials and equipment, although it is obvious that such provision must be based on somewhat economical lines.

Confinement in the Home.—Despite modern trends and scientific beliefs, the aim and object of the majority of expectant mothers is the old-fashioned one—to have their babies in their own homes. Undoubtedly there is much to be said for the maternity hospital, indeed it is almost imperative to arrange for confinements there in dealing with a certain class of the population. But when circumstances permit there is a strong case to be made out for the confinement in the home—even if we consider the psychological and sentimental aspects only.

A considerable expense must be incurred for the domestic confinement and the equipment in size and quality depends upon the family purse; it is true that the State now gives substantial assistance and that various organizations may help in certain cases. On the whole, however, the advent of the first child, at any rate, leads to an earnest searching for every possible item of equipment, so that the latter will be worthy of the event.

Essential Equipment.—There are essentials and non-essentials, and when the former cannot be provided, it is better to have the patient sent to hospital; needless to say, when domestic conditions are below normal hygienic standards it is useless to buy any equipment. In a proper scheme of antenatal care, of course, cases will have been classified and arranged for many months before the date of the confinement.

As an absolute minimum, there should be provided a cot for the baby, a bath, 2 kettles, mattress protectives, metal bucket, towel rail, some kind of draught screen, rubber apron, old linen, supply of clean bed linen, nightdresses for the mother, binders, bed stockings, towels, cotton wool, soap, face and body flannels,

layette for the child, baby powder, olive oil, liquid paraffin, safety-pins, needle and thread, infant's binder, bedclothes for the child, napkins, bibs, shawls and various other articles of clothing for the infant.

Non-essentials, but very useful articles are enamel bowls, bed-pan, nursing chair, high rectangular stool (for the child's toilet), weighing machine, extra buckets and basins, bath thermometer, plain gauze, hot water bottle, nail brush, old blanket, various toilet articles.

In any ordinary decently conducted household, most of the articles mentioned in both categories will be forthcoming by various routes; especially is there to be expected a goodly supply of knitted clothing and footgear for the child, produced by relatives and friends.

It is unnecessary in this work to discuss each item separately, but the nurse will no doubt appreciate the fact that improvisation and substitution may often be essential. This applies not only to the utensils required but to the clothing and dressings for the mother and child.

Confinement in the Hospital.—Very little need be said about this. The patient who has been under the supervision of the Local Authority maternity department and who has had the benefits of advice from the staff of the clinic concerned will have been classified and her condition recorded from time to time, so that any abnormalities are known to the medical officers of the hospital to which the patient is sent on the day on which it is obvious that labour is beginning. We may say that the ending of labour marks the end of the period of antenatal treatment; needless to say the subsequent period is supervised with as much care as the antenatal period. Indeed if full advantage be taken today of all the services provided by the State, the woman during her child bearing years need not ever be lacking in advice or treatment, for ample facilities are in existence for dealing with the postnatal ailments (if any) and with the health of the infant up to the school age. (See also Section XIV.)

TOXAEMIAS OF PREGNANCY

CLASSIFICATION. ALBUMINURIA. CHARACTERISTICS. SYMPTOMS AND SIGNS. PROGNOSIS. TREATMENT. PRE-ECLAMPSIA. SYMPTOMS AND SIGNS. TREATMENT. ECLAMPSIA. SYMPTOMS AND SIGNS. TREATMENT. TOXAEMIC VOMITING. SYMPTOMS. TREATMENT. ICTERUS GRAVIS GRAVIDARUM. SYMPTOMS AND SIGNS. TREATMENT. RARER TYPES OF ABNORMALITY. SKIN AFFECTIONS. EXCESSIVE SALIVATION. PRURITUS. CHOREA GRAVIDARUM. PUERPERAL INSANITY.

THE toxaemias, or toxic diseases, of pregnancy are certain clinical conditions peculiar not only to the pregnant state but also to the actual process of parturition and even to the fortnight which follows the event (lying-in period). As the word implies there is some poisoning of the blood and this gives rise to certain reactions of mind and body, the degree of severity depending in the main on the amount of toxaemia. So far as the toxin is concerned however, it is still impossible to say what it is, but most authorities believe that the blood may be affected by different influences, e.g. of a deficiency factor, excess or diminution of endocrines, or indeed some unrecognized toxic element.

Classification.—The toxaemias of pregnancy are often grouped according to degree of severity, each group of symptoms arising as a reaction to a certain concentration of toxins; this is a simple way to look at the condition and one which may suffice for the nurse.

Thus it has become the common custom to recognize the following groups: 1. common types—albuminuria, pre-eclampsia, eclampsia, toxaemic vomiting; 2. rarer types—icterus gravis gravidarum, toxic rashes and dermatitis, excessive salivation, pruritus, chorea gravidarum and various nervous and mental affections including tetany, neuritis and puerperal insanity. Each of these groups is briefly reviewed in the next few pages. It should always be borne in mind that some of these diseases may have origin in one of the so-called normal ailments of pregnancy, e.g. morning sickness, although with regard to the latter the great majority of women may suffer from it in a mild or serious way and yet their condition cannot be classified as toxic vomiting. This one

example should suffice to indicate how difficult it is to differentiate the various reactions. Since the liver and kidneys show evidences of damage to their structures, the clinical picture must be a variable one, depending upon the amount and extent of damage done.

Albuminuria

This is generally regarded as the simplest manifestation of the toxic state. It has been mentioned that from an early date in pregnancy the urine is examined at intervals, the reason being that it has to be ascertained whether or not there is albumin present. Normally, apart from special conditions such as those which follow the consumption of an excessive amount of protein and those which are associated with local (vulvar) debris or discharge, there is not even a trace of albumin in the urine. Albuminuria means that the metabolism of the protein elements of the food is not satisfactory, but especially that the cells of the body are being broken down.

Characteristics.—Albuminuria, discovered to be in existence in the last week of pregnancy, is quite a common occurrence in women pregnant for the first time; in any case it may be expected from the 34th week onwards. The earlier the diagnosis is made the more serious is the outlook, since eclampsia may be threatening. When a trace of albuminuria is found, therefore, the nurse should take immediate steps to have confirmatory tests done in which the vulva is thoroughly cleansed and the specimen is obtained by catheter and run off into a sterile glass. Albuminuria may also occur as a sign of independent disease of the kidney, bladder or urethra. The discovery of the smallest amount of albumin in the urine is the signal for calling in the doctor, and the latter, having eliminated such systemic disease, will no doubt have the patient watched very carefully for the rest of the time. Constant vigilance should have the result not only of obtaining satisfactory information as to the up-to-date condition of the patient but also of discovering any developments—e.g. of eclampsia—at the earliest possible moment. Every day the total intake of fluids for the 24 hours should be charted; needless to say the daily quantity of urine passed must also be measured. Quantitative estimates of the amount of albumin may be given by having the Esbach test made. Another very necessary procedure is the estimation of the blood pressure by the sphygmomanometer.

Symptoms and Signs.—These can be dealt with only in summary. The one thing to keep in mind is that albuminuria may degenerate into pre-eclampsia, and pre-eclampsia into eclampsia. Very careful observation must therefore be maintained.

The common symptoms are headache, dimness of vision, some-

times vomiting, diminution in amount of urine and swelling of the feet, hands, face and vulva. The common signs are oedema, rise of systolic and diastolic blood pressure, albumin in the urine with the urea in the urine well below 2 per cent.

Prognosis.—No further developments may take place and the confinement may be normal. Sometimes the condition becomes worse and this may be emphasized by the birth of a dead infant, born prematurely. The gravest complication is that of eclampsia, described later.

Treatment.—Since the aim of the doctor is to prevent the onset of eclampsia, to save the child's life if practicable and to limit the destruction of kidney tissue as much as possible, the treatment is based on these principles. As mentioned above watchfulness is of paramount importance. Furthermore the patient should be made to rest and the bowels should be kept fairly loose by purgative treatment strictly controlled. Finally dietetic restrictions must be applied. Patients do much better when they are put to bed and kept there until danger is past. Protein and fatty food should be reduced. Plenty of green vegetables and other carbohydrate food may be given. Sometimes it is necessary to give a salt-free diet, especially when the oedema becomes excessive, and coincident with this the fluids are reduced to a total of 2 pints per day. If in spite of the above care the albumin increases in the urine and the symptoms are moving towards the eclamptic state, labour may have to be induced and the pregnancy terminated. As might be expected all these decisions rest with the doctor.

Pre-eclampsia

As mentioned already, this condition is in the main a downhill development of albuminuria. It is by no means easy to say where the condition of the latter ends, however, and where the pre-eclampsia starts.

Symptoms and Signs.—All the reactions described under the heading of albuminuria are more emphatic. Pre-eclampsia may supervene on albuminuria in a very short time; the patient's weight suddenly and rapidly increases and the waterlogging of the body is much more widespread. In every respect the urinary examinations are more unsatisfactory, the albumin especially appearing as a distinct cloud. Headaches and eye troubles together exemplify the urgency of the situation. As a result of liver congestion there is vomiting and often pain. The nurse must bear in mind that pre-eclampsia is a dangerous state; in the course of one morning the patient may become much worse; the

nurse should look especially for increase in oedema and decrease in the quantity of urine passed. Most authorities recommend that the blood pressure be estimated twice a day.

Treatment.— All the measures taken in albuminuria must be intensified. When the oedema becomes obviously threatening, it may be necessary to resort to the salt-free diet and to purge the patient. Feeding per rectum with 5 per cent of bicarbonate of soda and 5 per cent of glucose may be instituted 4-hourly. On no account should diuretics be given. The foetus may have to be removed by Caesarean section if the emergency should demand it; other less urgent methods are the rule.

Eclampsia

This is the condition which can truly be referred to as frightening. Any one who has had experience of having charge of a case can never forget the experience.

Symptoms and Signs.— There are 2 main types of eclampsia described. The first is that which can be traced back to an earlier albuminuria, not necessarily disturbing, but nevertheless resistant to treatment. Here we may expect fits to begin during labour.

The second type, generally known as fulminating eclampsia, is sudden and alarming, since the patient, free from any signs of the condition all through her pregnancy, suddenly is seized with a fit just before labour begins or even in labour; the fits may actually start after the child is born.

Pre-eclamptic symptoms may be regarded as belonging to the preliminary stages. The main incident of eclampsia is undoubtedly the actual fit, however. There is generally some initial twitching which is to be seen on the face, hands and feet; no other type of fit begins like this. The stages are those of epilepsy, so that the preliminary twitches give place to tonus which affects the entire body and which may turn the patient black in the face because of paralysis of the respiratory muscles; opisthotonos is the general rule; the tongue may be bitten. This state may exist for half a minute. Then follows a longer clonic phase, perhaps for 3 to 4 minutes, in which all the muscles undergo clonic contractions, and there is copious frothing at the mouth. Thereafter, in the true pattern of epilepsy, there is the comatose stage in which the patient is stuporose and fatigued; the degree of coma varies, but often it is deep and lasting. There is great difficulty in breathing. No hard and fast rules can be laid down about the number of fits. There is rarely only one—very often 3 to 4—and there is a possibility of the number reaching 100. When the comatose reaction is marked the outlook is grave.

Treatment.—Medical attention should be sought for at once. In most cases the doctor will be on the spot anyway. Needless to say the patient should be in bed, and the management of the fit is based on control of movements sufficient only to prevent the patient from harming herself. The less these movements are checked the better for the patient, and this applies even although she has fallen down suddenly on the bedroom floor. No attempt should be made to transfer her to bed during the fit. But protection from furniture, fire and so on should be ensured. Any constriction of the clothing should be eased; false dentures should if possible be taken out. The tonic spasm may cause tight closure of the jaws and this may give rise to great difficulty in the removal of false dentures and in the insertion of a gag which will prevent biting of the tongue. It is quite permissible to use any type of improvised gag, even a bit of firewood or a kitchen wooden spoon; by use of these the jaws may be opened sufficiently to allow for drainage of the bloodstained saliva. In dealing with a case of eclampsia, it is wise to bear in mind that however great the amount of good done by first-aid treatment may be, the fits are likely to return; everything should therefore be done after the first fit to prepare for the next, even although it is quite possible that the doctor, if he be not already at the patient's side, will have arrived before it occurs.

When for any reason the doctor is not immediately available, the patient should be put to bed, shock treatment applied and care taken above all that the head is turned to one side and satisfactory drainage of saliva established; the dangers of suffocation and indeed of being drowned in saliva and mucous secretion are very real. Most authorities advise that as soon as possible the patient should be transferred to a hospital, since there exist nowadays so many facilities for the rapid and efficient transport and treatment of such cases. Whether or not this is possible, the following measures should be adopted. First with regard to sedatives: as might be expected there are different schools of eclampsia therapy, but commonly it is agreed that morphine should be administered subcutaneously ($\frac{1}{4}$ grain) and chloral hydrate (60 grains) per rectum. This treatment is repeated at intervals depending upon the frequency and severity of the attacks. So long as the patient is unconscious, there is no need to give other drugs and the doses of the latter are generally reduced as the patient becomes controlled by the narcotics mentioned above; in an ordinary case of severe eclampsia it is quite customary to give up to 2 grains of morphine and 240 grains of chloral hydrate in the first 24-hour period. But it should be realized that there are many widely divergent principles with regard to type and amount of drug to be given.

The giving of fluids and the removal of the urine by catheteriza-

tion are measures about which certain controversy also exists. It is freely accepted that the essentials of treatment are rest, quietude and the minimum of disturbance. It is agreed also that ample fluids should be given, generally in the form of weak solutions of glucose; but it may be difficult to give these by the mouth, for the reasons stated above; in such cases the accepted therapy is the giving per rectum of the dose of chloral hydrate in 10 ounces of water to which 5 per cent glucose has also been added. The only difficulty here is that if as a result of the added stimulation there should be signs of fits, a small amount of chloroform may be administered, so that the patient becomes lightly anaesthetized. For the same reason chloroform administration may be required in order that the catheter may be passed and urine withdrawn every 4 hours.

It will be clear that one of the main objects of modern treatment is not to set up a fit by overdoing the treatment; experience alone can determine the fine adjustments that have to be made in order to keep the patient satisfactorily quiet. In no respect is this more clearly emphasized than in administration of chloroform; formerly this drug was given, we might say, *ad lib* but now expert advice warns us against its use unless in the most difficult circumstances.

The nursing of the patient is important. The room should be darkened and rendered quiet, and there is no limit to the efforts to be made to prevent the stimulation of fits by the influence of light and noise. Even draughts should be rigidly dealt with. The maxim is not to disturb the quietened patient and to maintain the quietude. The nurse should be ever on the alert to deal with a fit, but should also take the greatest pains to prevent its recurrence.

Lastly, a word about the removal of the foetus. For a long time there have been 2 distinct opinions: 1. that the pregnancy should be terminated as soon as possible; 2. that termination of pregnancy is not called for unless the therapeutic measures should fail or unless it so happens that the labour is well advanced. It is now fairly widely accepted that to force labour or to perform Caesarean section on an eclamptic woman is dangerous, but no harm can be done in suitable cases by rupturing the membranes (see later) and expediting the birth. After labour has started it is customary to give ample quantities of chloral hydrate or paraldehyde, so that recurrence of the fits is prevented.

Toxaemic Vomiting

As already stated, the usual morning sickness of early pregnancy does not amount to anything of a grossly disturbing or dangerous nature. But when vomiting is obviously excessive and quite apparently causing a threat to the patient's health, active measures must be adopted in order to stop the vomiting. Here

let us put on one side all the systemic conditions which might be mistaken for toxic vomiting (gastric ulcer and other alimentary disorders, cerebral conditions, tumours or displacements of the uterus). These must be eliminated from the diagnosis in the first place.

Symptoms.—It is generally agreed that toxæmic vomiting (also known as hyperemesis gravidarum) occurs more frequently in highly strung women and therefore is of neurotic character; there are more serious symptoms and signs, however, and as these occur in more stoical women, without any evidence of the neurotic disposition, and as they are dangerous unless dealt with promptly and efficiently, they are clearly in a category quite distinct from the first. There is no need to go into theories of causation of which there are several. The clinical picture as seen by the nurse is one which rarely is evident after the 3rd month of pregnancy. The true hyperemesis gravidarum is characterized by attacks of vomiting after each meal, so that most of the nourishment intended for the patient is rendered unavailable; this is the sum and substance of the danger. Furthermore, as the condition becomes worse there is vomiting not necessarily associated with meals; in this event gastric secretion and even bile may be brought up, and finally blood. The whole picture is one familiar to nurses—that of dehydration. The main signs are wasting, with wrinkling of the skin, constipation, offensive breath, furring of the tongue, reduced urinary flow, dermatitis of the face and some degree of cyanosis. In the very grave cases, when fatal termination is to be expected, jaundice appears and there is often delirium and coma at the end. One very important sign of severity is the rate of the pulse, which increases as the general condition becomes worse.

In the majority of cases, however, hyperemesis gravidarum does not go as far as this. The main signs are frankly more neurotic than alimentary in character. Certainly the urine is diminished; very often there is only a trace of albumin in the urine. Ketosis is often found in variable degree.

Treatment.—The first thing to do is to examine the patient's mind. This is often a job for the nurse, who by sympathetic ear can gain the confidence of the patient and can be told the most intimate facts of the case. Very often it will be found that fear of child-birth is at the root of the whole evil. Here psychotherapy may help, and every nurse can be a good psychotherapist, helping to elucidate mysteries and generally allaying the anxious mind. Rest and quiet are to be advised, the patient being instructed that when the sickness threatens she should go and lie down. Various solutions of glucose to which fruit juice has been added should be sipped slowly. Food should be as simple as possible, with the

minimum of meat and fats. Sedatives are successful only when the patient is the right type for such drugs. Constipation should be dealt with by giving laxatives at intervals.

In the more intractable cases, it is considered most suitable in every way that the patient should be admitted to a hospital ward. This has psychological as well as physical benefits to offer. The woman who sees others, perhaps in a much more serious condition, is likely to be affected by such sights and is therefore to be expected to make the maximal effort on her own account. Most treatment schemes dealing with those in advanced dehydration allow for constant rectal or intravenous drip, glucose saline being used. The patient should be encouraged to drink as much water as possible because even if the latter be vomited, at least some of it has a chance of being absorbed. The dietary may have to be reviewed and it may be necessary to start with fluids and gradually build up the food supply once more.

In the severely toxæmic cases when things are going from bad to worse only removal of the foetus will be of any use in the saving of the mother's life. Accordingly when the pulse becomes 110 or more, it is time to act, the foetus being removed by the vaginal or abdominal route, as considered more suitable by the obstetrician.

Icterus Gravis Gravidarum

The toxic jaundice, mentioned above as a terminal sign of toxic vomiting, is regarded by some as a dangerous sign of the latter condition, and indeed these two diseases are often described under the heading of toxic vomiting.

Symptoms and Signs.-- The degeneration of the liver being the main factor, jaundice comes on early and with prominence, giving its *cachet* to the whole syndrome of hyperemesis gravidarum. Fits, with rise of temperature, to be carefully distinguished from those of eclampsia, are typical of the disease. The blood pressure is not unduly raised and there is only a trace of albumin in the urine as a rule. The comatose condition alternates with convulsive phases; the whole situation is a very critical one.

Treatment.—The only hope for the patient lies in evacuation of the uterus. This is done in the manner most suited to the duration of pregnancy and is left to the obstetrician's judgment. Nevertheless the outlook is never good.

Rarer Types of Abnormality

Skin Affections.—Erythema and urticaria are incidental to pregnancy and are easily dealt with by soothing lotions. There is a form of dermatitis which belongs to the herpes group and

another which resembles impetigo. The areas affected are the back of the hands, front of legs and lower half of the abdomen. The only difference between these two groups is that the vesicle in one has herpetiform characters whereas in the other crusts form. The lesions may be seen in other parts of the body and usually appear after mid-term and persist up to term. Sometimes death occurs, for there is often associated liver degeneration, with coma. Once the child is born, however, these lesions tend to clear up very quickly. Calamine lotion applications are generally prescribed, together with rest and careful dieting.

Excessive Salivation.—This is similar to hyperemesis gravidarum and indeed may accompany it. In serious cases there may be dehydration. It is rarely necessary to induce labour.

Pruritus.—When pruritus is widespread and serious it generally means that the liver is affected; as a rule, however, pruritus is restricted to the vulva, and may indeed give rise to almost unbearable itch. The condition may be set up by irritative vaginal discharge such as that caused by the *Trichomonas vaginalis*. Sleep is disturbed and hypnotics may be necessary. Local soothing lotions are generally applied, as well as ointments incorporating camphor or methol.

Chorea Gravidarum.—This must not be confused with the so-called rheumatic chorea. Chorea gravidarum is an inter-current disease of pregnancy, generally seen early in the phase and very seldom after the end of the 6th month. Complaint of headache and then of insomnia, with twitching of the fingers and certain parts of the face, is typical; sometimes the case goes on to affect the whole of the body with typical muscular contraction. Very often the result is a miscarriage, especially when the pulse is increased and the temperature raised. Delirium may occur. So far as treatment is concerned, chloral and morphine are generally given by the usual routes but good results are reported from the use of brandy and paraldehyde, a mixture of these being given directly into the stomach by rubber tube. Another method is to keep the patient for 2 days constantly under the influence of paraldehyde. This almost invariably leads to cure. In very severe cases termination of pregnancy is the only remedy.

Puerperal Insanity.—The nervous affections such as tetany (a condition of spasm caused by parathyroid defect) and neuritis (which is often well marked) may be regarded as over-reactions to the pregnant state. They are mentioned only in passing. The most serious mental condition is the insanity of pregnancy, which should always be considered in conjunction with the serious puerperal insanity. Although the two conditions are distinct, the general background is the same. Women who become insane

during pregnancy may have reached their state of instability because of worry, general metabolic changes or even sepsis. Insanity as a complication of toxæmia is not difficult of comprehension. In fact when all the worries, anxieties and mental stresses and strains are considered, the state of pregnancy adds to any unstable mind just that extra jolt that leads to insanity. Although nearly three-quarters of those affected recover, a recurrence is to be expected in the event of a second pregnancy. Many obstetricians consider the advisability then of terminating the pregnancy. It is typical that melancholia of suicidal type is the dominating feature, this state gradually developing half-way through pregnancy. With regard to puerperal insanity proper, the condition is to be observed in the first week after delivery, and insomnia may be the herald; again melancholia is often found, but cases of mania are also common. When the doctor observes the advent of puerperal insanity, he may prescribe sedatives or hypnotics at once so that the condition may be controlled in good time. The prognosis as a rule is not very good.

CHAPTER 4

ABORTION

DEFINITIONS OF TERMS. CAUSES. CRIMINAL ABORTION.
CLASSIFICATION. THREATENED ABORTION. INEVITABLE
ABORTION. MISSED ABORTION. COMPLETE ABORTION.
INCOMPLETE ABORTION. TREATMENT.

THERE is no term in the medical nomenclature which is more constantly misinterpreted than that of abortion. The reason for this is that unfortunately abortion by natural means (and often inevitable) is too often associated with the term, criminal abortion, by which is meant the illegal termination of pregnancy by the use of instruments, drugs and the like. To the medical profession the difference is quite clear; the definitions accepted are as follows.

Definitions of Terms.—A foetus does not become viable (that is to say able to live) until the pregnancy has existed for 28 weeks or roughly 7 months. When a child is expelled before the end of the 28th week such birth is referred to as abortion or miscarriage, generally the latter. When the child is born after the 28th week, the birth is termed premature labour or premature birth.

Causes.—It is not easy to quote dependable statistics for abortion. Many women abort early and say nothing about the incident; many of the abortions of the first 8 weeks of pregnancy may be regarded as tardy menstrual periods by the women concerned. Furthermore, there is always the fact to be kept in mind that pregnancy does not require to be notified. It is thus impossible to make any reasonable statements about the number of pregnancies in any year or about the number of miscarriages. It has been estimated that at least 20 per cent of pregnancies end in some kind of premature delivery, chiefly miscarriage, but as very few women choose to advertise these occurrences and in fact rather tend to keep quiet about them, it is very difficult to be certain about this figure.

The actiology of abortion is fairly complex; it is said, however, that more abortions occur at about the 11th week than at any other time. Half of the cases reported on by patients or seen by

doctors have no known cause. The list of possible factors is therefore a big one. On the mother's side for instance, lack of vitamins and certain endocrines, chronic diseases such as nephritis, diabetes mellitus and so on, various intoxications associated with minerals (e.g. lead poisoning) and with micro-organisms (syphilis, fevers and the like), and a state of high blood pressure are all to be remembered in the search for a cause. Probably syphilis is the

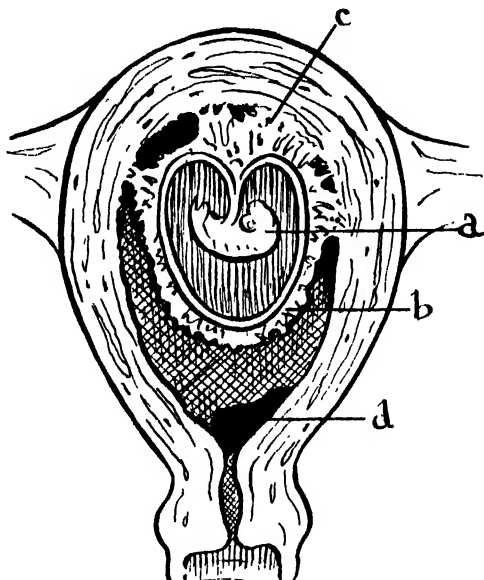


FIG. 146.—INCOMPLETE ABORTION

a, Embryo; *b*, Chorion; *c*, Placenta at very early stage; *d*, Blood clot plugging internal os of cervical canal, which is dilated.

commonest cause of abortion. Local defects of the maternal organs may also be causative factors. Displacements of the womb, tumours, cysts of the ovary and cervical tears may all lead to abortion, and in the pregnant uterus the decidua may not be in a normal state. There may have been some defect in the sperm cell of the father. There is a category which comprises abnormalities of the ovum itself and which includes hydatid mole, hydramnios (excessive waters) and disease of the placenta; nor must it be forgotten that anything which interferes with the position or growth or other development of the fertilized ovum may lead to the occurrence of miscarriage. In the so-called traumatic group are cases which arise because of mechanical jolts or falls; it is believed also that the uterus can be affected by excess of

emotional reaction, since the uterine muscle is stimulated to contract. The uterus or the appendages, or both, may be injured at operation, despite the greatest care taken by the surgeon. But despite all the above causes, the one that is most interesting and that demands most study is the criminal abortion, produced by interference mechanically by instrument or drugs introduced at any part of the genital canal from the introitus to the fundus. Many of the above causes will be clearly understood by the nurse who has read Chapter 1. Little more need be said therefore about the aetiology of abortion. There is one point however that demands mention. Certain women have repeated abortions, although they may go to full term on occasion. When there is a series of miscarriages in a woman who is not syphilitic, the inference is that there is not sufficient progesterone to maintain the pregnancy, that the supply of vitamin E is unsatisfactory or that there is something fundamentally wrong with one or the other or both of the reproductive cells.

Some commentary on the above list must be made. In the first place, it is not an uncommon thing for small haemorrhages to occur, especially in the early weeks of pregnancy; these should always be investigated, although they may not be of much importance. It has already been pointed out how such haemorrhages, when they occur in the 1st or 2nd month at about the time of the expected period, may be mistaken for menstrual flow. Secondly there is the important matter of trauma, which comprises all physical and mental shocks. All pregnant women are warned against taking any risks in the ordinary domestic routine; slight falls, slips, jolts against furniture and the like may disturb the ovum. Many believe that a large dose of saline purge is one of the best abortifacients; here the effect is one of internal disturbance and loosening of the ovum. So far as mental shock is concerned, a fright or the receipt of bad news may equally lead to abortion.

Criminal Abortion.—In deliberate attempts to procure abortion, it is to be expected that primitive methods will be adopted, since the abortionist in most cases is unskilled in medical science. This criminal offence apparently goes on unchecked; now and then a fatality brings the abortionist to light, but generally speaking there is still a considerable "business". Various instruments may be used— the uterine sound, knitting needles, catheters, crochet needles— or resort may be made to drugs given either by the mouth (quinine, ergot, pennyroyal, savin and the salines referred to above) or by vaginal douching (strong disinfectants). Grave danger may be caused to the patient by lacerations of the perineum, vagina, cervix or other adjacent structures, with subsequent sepsis. Some women believe that by taking very hot or very cold baths, especially after a brisk half-

hour of strenuous exercise in the gymnasium or at home, displacement of the embryo will occur and a miscarriage take place.

Nurses should always be alive to the possibilities of criminal abortion, especially when the miscarriage occurs after the 2nd expected period has been missed and the woman is convinced that she is actually pregnant. Care should be taken not to become involved in any situation which might end in inculcation. The medical man should always be told of any suspicious occurrences. So far as he is concerned, there are occasions when it is within his power to procure abortion (on account of danger to the mother's life) and generally speaking there is not the slightest stigma attached to such procedures; the nurse need not fear that her association with such a case is in any way criminal.

Classification.—The following types are recognized: threatened abortion; inevitable abortion; missed abortion; incomplete abortion; complete abortion.

Threatened Abortion.—This, as implied by the name, indicates that a process of abortion has begun, but that for some reason the process has not continued: reparative forces have intervened and the hold of the embryo has been made firm. Threatened abortion is to be encountered in the first few weeks of pregnancy. There is some discomfort but very little actual pain in the lower part of the abdomen, and the hæmorrhage is not severe. The internal os of the uterus is not dilated. The main principle in the treatment is watchfulness; a threatened abortion may become an inevitable abortion (see below). For a few days the patient should be kept very quiet and in bed; early medical examination should be arranged, and provided the doctor considers that there is not likely to be an inevitable abortion, great care should be taken that the movements of the patient in bed are reduced to the minimum. Good results follow mental and physical quietude and often the incident is over in a week, the course of pregnancy going on as before.

Inevitable Abortion.—This is best explained by saying that it is the completion of the process described above. Very serious bleeding, abdominal pain, pallor, dizziness and even sickness on the part of the patient suggest that inevitable abortion has occurred. Nurses should avoid interference with the pregnant uterus in the course of their ordinary work but in the event of symptoms being complained of by the patient of fullness in the vagina or of pain in the cervix or of bleeding followed by clear discharge (liquor amnii), it is advisable to investigate. The os will probably be found to be dilated and the embryo may indeed be passed as the nurse examines. When the embryo has been passed, steps should be taken to keep the patient absolutely quiet in bed, stimulating drink or food being avoided. It is clearly the duty of

the nurse not only to save the embryo for the doctor's inspection but also to control haemorrhage and to do all in her power to avoid the occurrence of dangerous complications. Otherwise the watching brief should be held; on no account should there be interference in order to end the process of expulsion. In the event of the doctor having to perform a minor operation for the removal of the embryo, the usual preparations have to be made, but generally speaking the nurse who is called out to attend a case of inevitable abortion will find that her work is of routine character—estimation of pulse, temperature and respirations; cleaning up

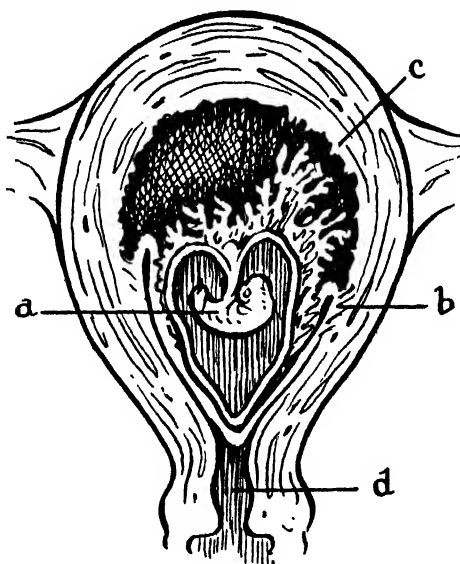


FIG. 147.—INEVITABLE ABORTION.

a, Embryo; *b*, Remnants of placental tags;
c, Portion of placenta with accumulated blood clot
behind; *d*, Cervical canal dilated by blood.

of the personal clothing and bedclothes of the patient; antiseptic washing of the perineum and padding with gauze and cotton wool. It will be obvious to the nurse whether shock is severe by the presence of signs such as pallor, dryness of the lips, sighing respiration and so on, and this should be dealt with by raising the foot of the bed and the usual application of heat in various forms. In very severe cases and when a doctor is not on the spot, plugging of the vagina may be called for. This is especially the case when the abortion is firmly stuck in the cervical canal.

Missed Abortion.—This is a rather rare condition. Actually

the abortion has occurred and the dead embryo is imprisoned in the cavity of the uterus. This is generally known as a false conception or carneous mole. There is some initial bleeding, then a slight reddish-brown discharge; but the ovum may be retained for some weeks or in difficult cases for several months. On examination the discharge may be found to have ceased, but the uterus is firm and small as compared with the normal pregnant size. It will be noted also that many of the normally coincident signs of pregnancy are disappearing, e.g. development of the breasts. In the event of the fleshy mole not being passed naturally, the doctor may have to operate; needless to say the preparations for this are as for an ordinary minor operation, whether the operation be done in the home or the hospital.

Complete Abortion.—As the name suggests, this term is applied to the abortion which has been expelled in its entirety, all the embryonic structures having been passed. Generally there is very little to report—small amount of bleeding, little or no pain, firm uterus.

Incomplete Abortion.—There are various degrees of incomplete abortion, but as a rule the foetal portion is expelled and the membranes and the whole or part of the placenta are left in the uterus. The signs and symptoms are an indication of the dangers. First there is generally severe haemorrhage for a day or two, diminishing and becoming dark brown later. Secondly the uterus will not be hard, but will remain of soft consistency and of the same size as it was before the abortion took place. There is a danger of uterine sepsis on account of the various tags of embryonic tissue left behind; these may become septic. The result is offensive discharge and attacks of haemorrhage. The condition is akin to that of puerperal septicaemia. There may be residual permanent damage to the uterus, especially the endometrium.

Treatment.—Much of the treatment has been discussed under the separate headings above. A few general points may however be emphasized.

So far as the nurse is concerned the most conservative attitude is called for; active interference, except in dangerous cases, is not to be encouraged. All that is required is palliative treatment, rest, quiet and reassurance until the doctor, always sent for urgently, arrives at the bedside. Here a word may be said for prophylaxis; it is true that no one can predict whether or not a primigravida is likely to abort easily. But after one or two abortions have occurred in a young married woman, it is time to decide as to the means of making it possible for her to go to full term. In this connexion progesterone given intramuscularly 3 times a week (10 to 20 milligrams at a time) and continued up to the end of the 5th month has been found to be successful. It is essential for the patient to

keep very quiet, all undue exertion being forbidden. Calcium and vitamins, especially vitamin E, must appear substantially in the dietary. Anything likely to disturb the embryo, e.g. strong aperients, should be advised against.

There is no need to enlarge on what has been said about operative treatment which is generally given in the hospital to which the patient may have been sent; the principles and practice may well be left to the gynaecologist. Much depends upon the stage at which the abortion is found and upon the state of the patient. The life of the latter is the first consideration. Otherwise, if there should be any hope of preserving the embryo, measures should be taken promptly to achieve this. Sedatives are generally prescribed—morphine, bromides—and progesterone is often administered intramuscularly by the doctor as soon as the diagnosis is made. In the inevitable cases, what might be termed a “little confinement” is the ideal treatment; here there is no need for interference since everything comes away naturally and the uterus heals rapidly and firmly. Incomplete or septic abortion requires great skill and experience on the part of the doctor as well as on the part of the nurse. Nowadays the use of one of the sulphonamides or of penicillin is the rule.

CHAPTER 5

STAGES OF NORMAL LABOUR

STAGES OF LABOUR. GENERAL CONSIDERATIONS. FIRST STAGE OF LABOUR. SIGNS AND SYMPTOMS. LABOUR PAINS. CERVIX UTERI. MUSCULAR ACTION OF THE UTERUS. DILATATION. CLINICAL PICTURE. SECOND STAGE. FORCES AT WORK. VAGINAL DILATATION. CLINICAL PICTURE. THIRD STAGE. RELEASE OF PLACENTA AND MEMBRANES. THE UTERUS. NOTES ON MANAGEMENT OF LABOUR. FIRST STAGE. SECOND STAGE. THIRD STAGE.

PARTURITION takes its normal course in the majority of cases. The child is delivered by a process which has a clearly defined sequence of events, and any deviations from the normal are at once noted by those qualified in obstetrics. When we speak of normal labour, therefore, we mean that there have not been any intercurrent difficulties foreign to the natural routine. In this work normal labour—and in its fundamental aspects only—is considered; the study of the various presentations and of the many complications constantly met with in a large midwifery practice must be left to full textbooks on the subject.

Stages of Labour

There are 3 stages of labour to be recognized and each is dealt with in turn below. Only full-time delivery is described, and it is hoped that the general nurse will gain a satisfactory knowledge of what happens at a typical birth and one of a pattern common to the majority. It will be well understood that in a summary of a process that goes on from a few hours to a few days many omissions are inevitable; great care has been taken however to include all the items which are of importance.

General Considerations.—The 40th week of pregnancy finds the expectant mother anxious to see the end of her long ordeal and to reach that end as quickly as possible. As already mentioned, the uterus descends in the last few weeks of pregnancy and there is usually a certain amount of discomfort at the level of the pelvic brim, some pain, described as being like toothache, in the back and loins, and irritability of the bladder causing frequency

of micturition. When labour actually starts (the "zero" hour) and when the 1st stage can be said to have been initiated is not by any means an easy matter for decision. Many false alarms may be given, and this refers especially to the primigravidae, who do not have the experience of former confinements as the multiparae do. It is a well known fact that the nervous apprehension in the case of the first baby infects the whole household, and is often the cause of a summoning of the midwife or doctor earlier than need be. Allowances are made for this however by the latter; so far as the midwife is concerned, it is all to the good that she should be in touch with her patient earlier rather than late. It is thus assured that even the most insidious start of the 1st stage will not be missed.

Labour in its normal sense is a natural physiological process as is pregnancy. The precautions taken today are the results of potential dangers resulting from the so-called civilization as it is known to the present generation. We cannot forget that the primitive human being gives birth to offspring in a manner and circumstances akin to that of animals; it is not so long ago that the tinker mother had her children in a rough shelter perhaps behind a hedge, and any assistance she was able to obtain was, to say the least of it, elementary. Recovery from the experience was very quick.

Despite what is said above, however, the fact is that in the present-day state of society obstetrical science is required in its every branch, and thus the mechanism of labour and all that goes with it has to be closely studied and understood. Thus even the most insignificant signal prompts the obstetrician to investigate. Pain and discomfort of the last few days of pregnancy must therefore be given close attention.

Pains are variable. Many of them are known as false pains and arise from colic, flatulence or other intestinal conditions. The personality of the patient has to be taken into consideration and it is difficult to say which is the more desirable—the phlegmatic woman who declares she never felt better or the highly strung woman (usually young and pregnant for the first time) who interprets every unusual sensation as being the true initial pain of labour. Backache for instance is a very variable sensation; it may be caused by stretching of the sacro-iliac ligaments or the trunk or abdominal muscles; it may reach a peak and may be very uncomfortable. But such are not the true pains of commencing labour; these are quite clearly recognized and are the result of spasm of the uterus, as described later.

First Stage of Labour

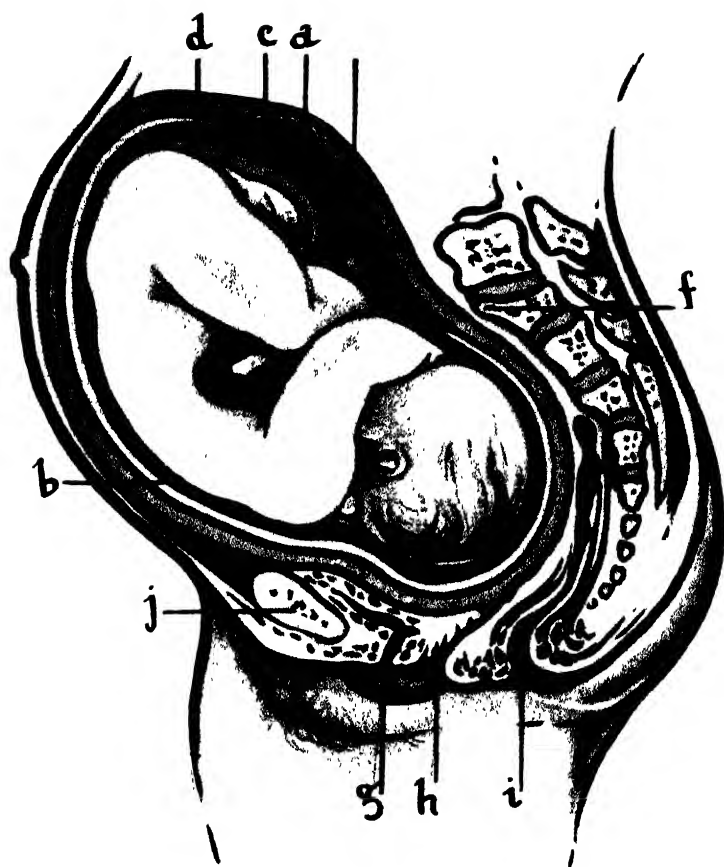
Hormonic influences are known to set the mechanism of labour

in action and the natural powers of the patient act in response to such stimuli. In the 1st stage the minute physiological changes which have started the process are intensified. The effect produced is one of complete dilatation of the os uteri—the opening of the door through which the foetus is to pass. In this stage we have to consider the symptoms and signs peculiar to it and the work of the bodily machinery, particularly the uterus. It is one of the common sayings in midwifery that childbirth involves a power, a passage and a passenger; it is clear that the reciprocal effects of all three must enter into any worthwhile study of labour.

Signs and Symptoms.—Sometimes the signs and sometimes the symptoms are more prominent—everything here seems to depend upon the mental and physical make-up of the mother-to-be. The nurse must give fair consideration to both and make her own assessment of the importance attached.

Labour Pains.—Pain, as mentioned above, is of a type peculiar to parturition. The multipara will recognize it and welcome it; it cannot be compared with any other type of pain. On analysis it will be found that these pains begin low down in the back and they tend to pass round the abdomen as if they were following some kind of girdle path. Any doubt as to the identity may be dispelled by watching the abdomen, the palm of the hand having been applied closely to the skin over the upper half. It will be noted that with the onset of the pain the uterine muscle passes into a spasm so that contraction occurs. It is a process of squeezing and for an obvious purpose. As the pain passes so the spasm wears off and the uterus becomes distinctly relaxed once more. With the recognition of the first true pain, the nurse may be more than suspicious that labour has begun; when the pains recur, and especially with greater frequency and force, there can be no doubt at all. As time goes on the true phases of the labour pain will be demonstrated: 1. crescendo phase; 2. peak; 3. diminuendo phase. Labour pains dominate all stages and must be referred to again and again in the following pages.

Cervix Uteri.—Examinations *per vaginam* should always be reduced to the minimum, but since a very important sign is to be found at the os uteri at least one p.v. examination may be made by the nurse. It will be found on inspection that there is congestion of the vulvar region, and when the fingers are passed into the vagina in the approved manner the os admits at least one fingertip; in other words, the door of the uterus is beginning slowly to open, this process coinciding with the contractions of the uterine muscle. What is actually happening is that by a process of thinning of the mass which is the cervix, the circular orifice is being gradually widened; the process begins above and thus a funnel-shaped dilation is produced in the first place. At the same time



FULL-TIME FOETUS IN THE UTERUS

a. Uterine muscle. *b.* Chorionic membrane. *c.* Amniotic membrane. *d.* Amniotic sac. *e.* Placenta. *f.* Promontory of the sacrum. *g.* Urethra. *h.* Vagina. *i.* Rectum. *j.* Symphysis pubis.

the membranes of the embryo, lightly united as they are to the uterine wall, will be found to be detaching themselves in this process, and as this goes on frothy mucus and blood, churned up and intermixed are passed in small amounts from the external os. This sign is called "the show" and is one of the classical features of early labour; and it is a recognized indication that labour has well begun.

So far as the external os is concerned, the dilatation goes on apace, and very soon the outlet is about the size of half a crown; inside the vagina there is by now little evidence of anterior and posterior fornix; here we see the beginning of the formation of one simple birth canal. Like a diaphragm shutting off the os, however, would be observed the bulging membranes of the bag of waters or amniotic sac; with every pain these membranes are made to act like a soft bore which keeps up the dilating pressure, and although the pressure is relaxed between pains, there is advancement and steady progress as the pains increase.

Muscular Action of the Uterus.—A pause may be made here to consider what has been happening in the uterine muscle tissue. To expel the child efficiently as well as to maintain the opening of the canal involves somewhat different muscular powers. The bulk and power of the uterus is obviously enormous as compared with that of the small pear-shaped organ encountered in the study of the normal anatomy. But it should be noted that although the thickness of the non-pregnant uterus is about $\frac{1}{2}$ inch, the thickness of the full-time pregnant uterus is less than $\frac{1}{4}$ inch—that is to say the musculature has been thinned. The force of this muscular layer is applied evenly over the mass of the pregnant uterus and by its contraction it is able to lessen the cavity it surrounds. The relaxation that follows a contraction would be shown in the single cell under the microscope, the fibre being elongated and thinned, whereas in the contracted muscle the fibre is shorter and thickened.

The muscle system of the uterus however has other important qualities, and it is known that certain groups of fibres are massed together for specific function. For instance there is a longitudinal group which passes from the fundus to the cervix; there is an encircling group which acts like the hoops of a barrel, holding the uterus together in homogeneous mass; thirdly there is an oblique group which runs more or less diagonally from one side of the fundus to the other side of the cervix. It can well be imagined 1. that these groups acting in their particular way on the uterus will set up powerful contractions; 2 that no matter how great the strain, the pressure will be constantly and evenly maintained.

The uterine muscle is an involuntary muscle and acts independently of the will. Sometimes, however, there is an influence, probably subconscious, which affects the pains. For instance, the

pains may be going on well and generally producing satisfactory progress, when by some emotional or other influence they may stop. For this reason it is a common experience of the doctor to find that his arrival coincides with a lull in the pains, hitherto in full operation; as a corollary it may be remarked that sometimes it is necessary to restart the pains by a repetition of the incidents that caused the cessation, and the gentle remark of the doctor that he has arrived too early and that he need not wait is often responded to by the occurrence of a brisk pain. In normal routine however, the uterus behaves like any other abdominal organ—its action is automatic; there is a certain amount of control of course and this lies in the lumbar centre of the spinal cord, which sets the rhythm in its incremental phase, its acme, its declining phase and its repose. Reflex phenomena need be mentioned only in passing, but obstetricians make good use of this type of mechanism; to give only one example, when the os uteri is dilated by artificial means the uterus is stimulated to contract. The whole machinery of uterine contraction is gauged so that the power begins at the fundus and travels downwards, it being thus ensured that the forces are concentrated high up and applied to the movable mass below. To sum up what has been said above, the uterine muscle is involved in stretching, dilating and squeezing of the cavity of the womb, power and passage thus being provided for the passenger in his journey; the main effects are drive and dilatation.

Dilatation.—This has already been referred to so far as the action of the uterine muscle is concerned. In dilatation, a very narrow canal, which normally will allow the passage of nothing thicker than a uterine sound, becomes so much dilated that it will permit the passage of the foetal head and body. As already stated, the muscular power of the uterus is different in what is known as the upper uterine segment from that which is exerted in the lower uterine segment, in which the cervical canal is situated. What happens is that there is great stretching, as already stated, and a few lines may serve to explain how this is done. The secret lies in the dilating bag of membranes; a bag of fluid will exert pressure evenly all round and so bring about a homogeneous dilatation. Every time there is a contraction of the upper uterine segment the bag of fluid is squeezed; the fluid has to go somewhere, therefore it seeks to use the only outlet available—the cervical canal. Here is exemplified the power of fluid pressure and of the tension of any liquid which is contained in a closed bag. The dilating bag of waters is clearly one of the principal agents in the smooth transmission of the infant, acting as it does as a fore-runner to clear the way.

Coincident with and indeed inevitable to the dilatation, the cervix is “taken up” as the expression goes; by this we mean that the uterine muscle tends to retract longitudinally and so pulls up

the very much thinned muscle into the main structure of the uterus.

Clinical Picture.—So far the premonitory signs of labour have been dealt with and the powers and passages. In the clinical picture it is necessary to see how the passenger is affected by these two factors, the whole study involving reciprocal action of all three.

The end of the 1st stage is indicated by the full dilatation of the os, and it is necessary now to review all the happenings that lead up to this. In the case of the first child the time taken by the os to dilate fully is anything from 14 to 18 hours, but the multipara may only require 9 hours as a maximum and very often less. The delays incidental to the primigravida are various, but the main delay is caused by the simple fact that the tissues are going through a new experience—they are not accustomed to the passage of such great bulk. The birth-canal of the mother of 8 children for instance has become used to parturition and thus the bag of waters acts more speedily.

Pains.—Once again we refer to our signal of progress—the labour pain. In the 1st stage the pains are constantly becoming more and more intrinsic to the pattern. The patient should be told what they mean and should be ready to give all assistance with her auxiliary muscles when the pain begins. Furthermore she should be encouraged to give warning when the pain develops, so that her attendants may be at her side. The contraction at the fundus can be observed quite easily, as also the subsequent relaxation; with each pain it must be understood that small, imperceptible but vital changes are taking place.

A point which can be emphasized over and over again is that in any normal labour, even although the tempo may be slow, pains which are purposeful and effective can be recognized at once by doctor or midwife. Observation of 3 or 4 pains is enough to give all the information needed. Even the patient is capable of saying whether the pains are—as they are termed—good, or

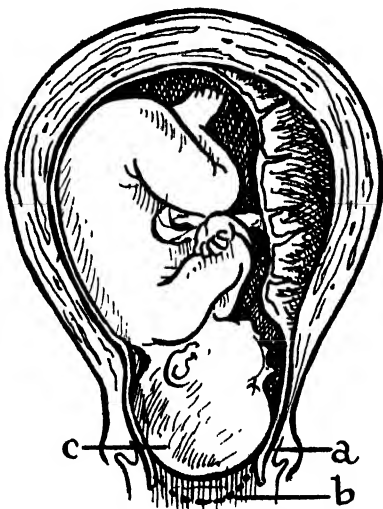


FIG. 148.—DILATATION OF CERVIX.

a, Cervix taken up completely; *b*, Line of rupture of membranes; *c*, Foetal head acting as plug and dilator.

whether they are unsatisfactory. As the strength and frequency of the pains increase, progress becomes encouragingly good and the moral effect on all in the confinement room is evident. It has been well said that the acme of the pain which is a good one coincides with the moment at which the patient feels that she cannot tolerate it any longer. Owing to the plan naturally laid down for birth, it is unusual and indeed abnormal that pains should occur regularly or with similar force each time. There are what might be termed defensive phases and offensive phases, but these are part and parcel of the scheme of parturition; every pain has its function and its correct application.

The Membranes.—The work of the fluid wedge formed by the bag of waters is best understood by observation of the perineum before, during and after a pain. When retraction takes place there appears to be quite a shrinkage of the dilating cervix, but when the power is once more turned on, the advancing wedge makes quite an excursion, so that the greyish-blue membranes may be observed to bulge; when the pain passes off the membranes recede again, but the experienced eye will note even the smallest amount of progress, for the latter makes an alteration of the picture when relaxation is complete. The greatest care should be taken in handling the membranes; the whole purpose of the obstetrician in the 1st stage is to maintain the integrity of these structures. If unhappily they should become prematurely ruptured the accident may disturb the whole course of the subsequent labour (dry labour).

The Os Uteri.—By the end of the 1st stage it is obvious that the os uteri has reached its maximum so far as dilatation goes; as mentioned above, the physiological mechanism is such that one big canal is formed. Every time a pain occurs there is an increase in the fluid wedge and consequently a further dilatation. As might be expected, this has its limits, and in order to make the circle as wide as possible, there is a drawing-up action of the uterus—an upward pull of the os towards the fundus. This is in effect the last of the taking-up action and it is productive of great smoothness at the site of the os uteri. By now indeed it is true to say that for all practical purposes the os has disappeared into the general structure of the birth canal.

The Vagina.—The vagina in its normal state is rather lax if not flabby. Towards the end of pregnancy it may become congested by pressure on the veins. But as labour progresses the vagina dilates also, chiefly on account of the descending foetal head, with this we see the completion of the curved tube through which the presenting part (normally the head) will soon pass. At this stage the uterus and vagina are said to be completely canalized and the process is referred to as canalization. It is impossible to recognize where the uterus ends and where the vagina begins.

Second Stage

The most prominent feature at the start of the 2nd stage of labour is the presenting bag of waters. With every pain, especially at the acme, they have all the appearance of being ready to burst, but they usually resist successfully. If the 1st stage has been one of preparation and passive action, the 2nd stage is one of exactly opposite type—here there is normally activity and movement.

Forces at Work.—This is the stage during which the powers are employed to the full—not only the intrinsic forces of the uterus, but also the auxiliary muscles, especially those of the abdomen. Before the rupture of the membranes the powers are applied, in an indirect way, on the fluid surrounding the foetus, but when, soon after the 2nd stage has begun, the bag of waters gives way and the small amount of fluid in front of the child's head is expelled, the head continues its descent and inevitably there is more room left in the cavity of the uterus at the fundal end. Now the foetus is a lumpy mass stiffened by its core which is the vertebral column; it will therefore stand quite a considerable amount of direct pressure, and this in fact is what occurs. The strong muscle fibres of the fundus bear directly on the upper end of the foetus and the action has now become that of direct pressure—it is a pushing action. The head is given every encouragement to make progress, for it works in a well-lubricated tube. The powers at work are very much akin to those associated with defaecation.

Retraction is now very much in evidence after each pain; the upper uterine muscles become more firmly knitted together, gathering their forces for the next push. The maintenance of this power is of vital importance; when it fails (uterine inertia) calamity is the apt term to describe the situation. It should be realized that the uterine muscles have a long ordeal to go through; later on the passage of the presenting part over the perineum may be the occasion for stiff resistance, so that the foetus moves up and down at each pain without showing much progress. This procedure, well described as "crowning," may put the compressing muscles through their severest test, but victory is of course inevitable.

A word should be said about the auxiliary muscles. The main muscles which assist the uterus are the external oblique, the internal oblique, the transversalis and the rectus abdominis (all of the anterior wall of the abdomen) and the diaphragm above. There are various methods of making full use of these muscles as described later, but for the time being we may leave the subject by saying that all acting in concert reinforce the uterine pressure

and help to counteract the resistance at the pelvic outlet. Needless to say, such reinforcement is neither required nor desirable in the 1st stage.

Vaginal Dilatation.—The preparation of the vaginal canal goes on in the 2nd stage; the strong pulling power of the uterus draws up the anterior wall of the vagina, and with it the posterior part of the bladder and the urethra. The road along which the foetus is to travel is thus further cleared of potential obstacles.

Clinical Picture.—What does the nurse see in the 2nd stage? The first (and it might merit the term, dramatic) incident is the rupture of the bag of waters and the escape of so much of the amniotic fluid—an event hailed joyfully as a rule. Assuming that the presentation is the normal vertex (or head) presentation, the cleft of the vulva will be observed to be widening, the opening gradually becoming more and more patent. The whole perineal area gradually rises like a mound with the anus in the centre; the head makes a considerable excursion every time a pain occurs; this gives a rapidly changing picture which holds the observer's interest, for something is happening rapidly and fundamentally. The perineum may appear to be quite slack and collapsed after a pain but with the onset and development of the next the bulge grows increasingly and now the anterior wall of the anus is clearly stretched. The fact is that the more delicate and more easily injured tissues such as those of the bladder are thus saved from damage, whereas the perineal tissues—tough in composition—take all the strain of delivery.

With the head on the perineum, the 2nd stage is nearing its end. The vaginal opening becomes oval and circular in turn and soon the dilatation remains. Then, when it would seem that one last pain would finish the job, Providence sends the last pain, and it is usually a good one, for it causes the head to be passed completely beyond the vaginal opening. Nothing mechanical devised by man can surpass this wonderful performance, which has to be seen to be fully appreciated.

There is tension everywhere now, but a brief interval gives the midwife the opportunity to wipe the child's eyes with gauze. Then, true to type, the head turns through a certain angle and very soon after a further pain expels the body. The infant is born; the whole procedure will probably have occupied half an hour or less in a multipara. For a primipara about an hour and a half is the average time in the 2nd stage.

The infant is still attached to the umbilical cord, which in its normal ample length hangs down from the uterus. The latter already shows considerable shrinkage; the fundus is just below the umbilicus. If the nurse has time, she can place the palm of her hand on the abdomen and confirm that the epigastrium is flat

and that the somewhat irregular melon-like uterus is gathering its powers once more for the last act—expulsion of the placenta.

A few words may be said in conclusion regarding the use of adjuncts to delivery, apart from instruments of obstetrical type. Many old customs are still in vogue and it is questionable whether or not they are believed in by a proportion of doctors and nurses. For instance, in the 2nd stage it has been, for perhaps centuries, the custom to tie a towel round the top of the bed and allow the patient to pull on it and so reinforce the auxiliary muscles during a pain; again some women say they are better off when they can press their feet on a stool placed at the bottom of the bed. Some women choose to be confined in the standing position or bending over a chair. Undoubtedly all these customs die hard and it can only be concluded that they are kept up because they are good. In most cases however, once the 2nd stage has been reached the patient is put to bed and kept on her left side, preferably with the buttocks close to the edge of the bed and the head to the left of the pillow.

Third Stage

This is a brief stage, but a very important one. Sometimes its duration is no more than 10 minutes, but the average is about 20 minutes. All the reactions are easy to follow. Three main incidents should be recognized: 1. separation of the membranes and placenta; 2. delivery of the placenta; 3. reaction of the uterus.

Release of Placenta and Membranes.—When the placenta is mentioned the associated membranes are understood as well, so that the use of the word, placenta, has the added meaning in all that follows. The 3rd stage begins with the speedy examination of the child and especially of the umbilical cord, which should show signs of pulsation for some minutes. The slow disappearance of this pulse is an indication that the placenta is detaching itself from the uterine wall. The uterus has continued to shrink; only at the placental site is there evidence of a spongy-like swelling.

The patient is turned so that she lies on her back with the thighs drawn up. The cord has been cut and tied, and the baby has been removed in a blanket to his cot. It will now be observed that there is a spasmodic trickle of blood and blood-stained fluid from the vagina and it may be that the advance in the delivery of the cord is perceptible. Meanwhile it is advisable to consider what is going on at the placental site. It will be remembered that in discussing the formation of the placenta we mentioned the perforated layer. It is at this layer that the placental tissues come away; the whole process is one of blood-clotting behind the sponge-like placenta, the latter being detached by plication of the uterine lining. Very soon the whole of the placental mass and membranes is cast off and as the uterus continues to close in on

this body (now free), there is a minor expulsion to be gone through once more; it is almost free from pain. There may be a few small

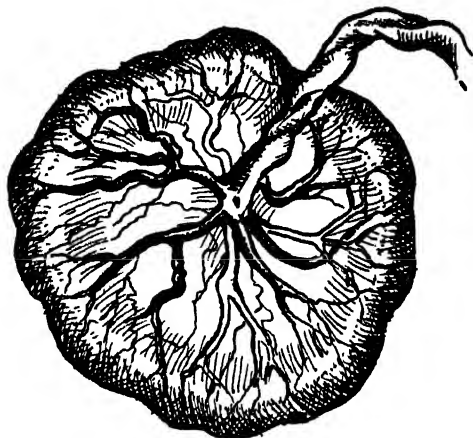


FIG. 149.—PLACENTA AT FULL TIME
(FOETAL ASPECT).

twinges, but with a final effort the placenta is forced out of the uterus and can be delivered from the vagina. Nevertheless, simple

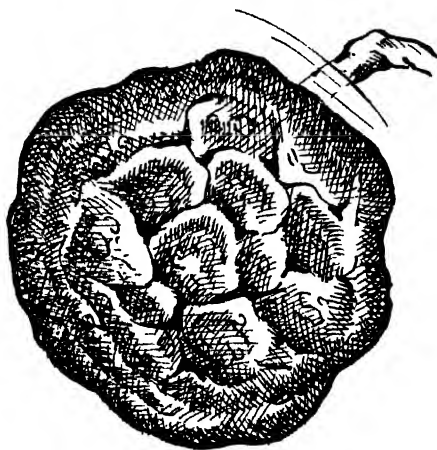


FIG. 150.—PLACENTA AT FULL TIME
(UTERINE ASPECT).

as this procedure may appear to be, it is one which demands the greatest care and attention. The one point to be emphasized is

that there is a great temptation to pull on the umbilical cord and so drag out the placenta; in the event of defects or disorders of the placenta this might lead to dangerous reactions, therefore the cord should be left well alone. As the placenta is forced outwards by contractions of the uterus above, it peels off—as one would peel off a stocking—its associated membranes, so that as Fairbairn has said, the placenta is like an umbrella blown inside out. It is obvious that the presenting surface must be that from which the cord springs, and that in its passage the placenta must go through the rent made in the membranes by the presenting head or other part of the child. Very often a special effort is required of the mother, in which the auxiliary muscles are used, so that the placenta may be completely expelled; nevertheless some pressure at the fundus is helpful. Once the placenta is on the perineum the rest of the membranes slip out easily as a smooth, well-lubricated tag; then follows a small and indeed negligible trickle of blood. Occasionally it is necessary to twist the membranes gently, one or two turns being all that is required.

The Uterus.—For various reasons, some of which were mentioned earlier in this work, the haemorrhage at the placental site is immediately stopped. Clotting is generally satisfactory and the growth of new endometrium begins soon. But as the period after the birth of the child is in the first 3 or 4 hours a threatening one from the point of view of post-partum haemorrhage, constant watch must be kept on the uterus. Now there is a classical condition of the uterus demanded by all good obstetricians immediately after the child is born: the uterus must be as hard as a cricket ball and about the same size; it can be felt easily just above the pubis and therefore a satisfactory check can be made. The nurse may be assured that as long as this cricket ball remains where it is there will not be much fear of haemorrhage.

Notes on Management of Labour

As this is not a work for midwives, it is not necessary to discuss in full how labour should be conducted. It is believed that in the foregoing pages ample descriptions have been given to enable the nurse to understand what happens at a birth and what she may have to tackle in an emergency. The principles of asepsis should be maintained all through when possible, but labour is a very untidy and often a most unconventional proceeding, and nursing principles proper can only be begun after the child is born. The dangers of puerperal sepsis must be kept in mind as well as that of haemorrhage or other obstetrical emergency, but it is surely obvious to any trained nurse that every effort is likely to be made to obtain the services of a doctor as soon as the emergency arises. The word, asepsis, seems to cover many requirements in midwifery

and the nurse will no doubt follow the rules regarding cleansing of herself and her patient, of maintaining the aseptic state as far as is possible and of doing everything to keep bacteria out or to destroy any which may have got in.

At the beginning of labour the administration of a soap enema (enema saponis: see Vol. II, p. 320) may help considerably, but when labour has clearly begun it is advisable not to attempt such administration. The nurse should be prepared therefore for some escape of faeces and even of urine in the 2nd stage of labour; constant swabbing of the perineum is to be advised, "Dettol" or any of the other well-known lotions being used. It is well to remember too that despite careful rubbing with soft paraffin or various oily preparations, the perineum may tear as the child is forced out of the vagina. Here again all efforts should be made to keep the parts free from micro-organisms.

First Stage.—With a healthy active patient it may be possible to allow her to walk about, even when the pains begin to be severe; the back of a chair may be used by the patient to steady herself when the pain comes on. The nurse should tell the patient not to press down, but to let the pain work out its own course. Urine will be passed often, an ordinary chamber-pot being used. Plenty of drinks should be provided, hot or cold according to season. Even light meals are permissible. It should be remembered too that the patient may become wearied, rather more mentally than physically, and will be none the worse for a rest in bed with snatches of sleep between the pains. Pain in the sacral region may be soothed by massage. If there should be any really dangerous signs, they will be self-evident, generally or locally, and easily recognized by the trained nurse. Let us agree however, once more, that the vaginal examination should be carried out as little as possible. When the os is fully dilated it is advisable to keep the patient in bed, since it is difficult to maintain any semblance of asepsis when the membranes rupture in an ambulant patient. The patient should lie as already stated on her left side with the buttocks well over towards the right side of the bed; sterile towels fixed with safety pins are put below her and they can be changed when need arises.

Second Stage.—The nurse should be in the room constantly. Overall, mask and gloves should be worn. Preparations should be completed for the reception of the child; here an experienced member of the family—often the patient's mother—may be of great assistance. Once the child begins to move in earnest there is a need to give the patient all help. Especially is this so in the case of the young primipara, who generally has difficulty in using the auxiliary muscles and who does not appreciate the proper way to get the most help from pulling on a towel. Between pains,

relaxation should be complete and should be insisted upon. The nurse should bear in mind the precautions to be taken to try to save the perineum from rupture. When crowning begins it is to be hoped that the doctor is in charge and that an anaesthetic is available. Constant swabbing of the perineum should be maintained.

After the birth of the child, its throat may be partially blocked by mucus and other material, therefore it is well to clear out the passage with the finger and a small piece of gauze; breathing will soon start. The body will be pink, but generally it is covered with a patchy white layer of vernix caseosa, easily removed later.

During this stage temperature and pulse may be checked now and then. A pulse of 80 need not cause any concern, and even a temperature of 99°F. may be of no moment. The nurse should watch the cord: 5 minutes after pulsation has ceased it is time to put on the ligatures. These should be ready, in sterile water. No. 1 should be applied about 2 inches from the child's navel and No. 2 about 4 inches from the child's navel, or 2 inches further up. Reef knots should be used. Sometimes artery forceps are preferred. The cord should be cut with sharp blunt-end scissors between the 2 ligatures. The child should be enveloped in the shawl or blanket and should be handed to the waiting relative, who generally sits down at the fireside and waits until the mother has been attended to.

Third Stage.—The delivery of the placenta has been described above and this requires no further comment. During the wait for the placental tissues it may be convenient to find out whether there has been a tear of the perineum and if so what the type and extent may be. This having been done, the patient is turned on her back, the soiled pads below her being quickly removed and fresh ones put in their place. It is advisable to keep an eye on the fundus. A kidney basin should be in readiness for the placenta. The patient may feel cold, therefore she should be wrapped up as much as possible and a constant supply of hot water bags should be arranged. The placenta will probably be expelled in less than 20 minutes; provided it is not stuck in the vagina the placenta can be delivered by 3 or 4 mild pains. Once it is certain that all the structures have been passed, the placenta is put into a bucket of water. The patient generally has a shivering fit, often referred to as physiological chill, and every effort should be made to bring warmth to her. The mopping-up process may be delayed on account of this, but no harm can be done. A little massage applied to the fundus will soon ensure the formation of the hard cricket ball tumour. In the case of the multipara, especially when an analgesic or anaesthetic has been given earlier, it may be necessary, and it is certainly prudent, to give liquid extract of ergot orally or an intramuscular injection or ergometrine or

posterior pituitary extract. The fundus should be examined by gentle palpation about every 10 minutes. So long as there is only a trickle coming from the vagina it is fairly certain that all is well. Much now depends upon pulse and temperature; the former may be as much as 80, but if the rate should rise to 90 or more, it is time to look for post-partum haemorrhage and undoubtedly the condition then would be serious.

The nurse should turn to the placenta and examine it in the water. It may be advisable for her to wait until the doctor sees it; if he finds that the membranes are intact, the placenta can be rolled in a newspaper and burned in the fire.

The final duties of the nurse are those of putting pads on the perineum, changing the patient's garments, making up the bed and seeing that the hot water bottle is hot enough. A thorough clearance of the confinement room should then be made.

CHAPTER 6

THE PUERPERIUM

THE NORMAL PUERPERIUM. THE UTERUS. THE CERVIX.
THE VAGINA. LOCHIA. MANAGEMENT OF THE PUERPERIUM.
GENERAL NURSING. ANTIMICROBIC PRECAUTIONS. VULVA.
BLADDER. BOWELS. DIET. PULSE. TEMPERATURE.
SLEEP. POSTURE. BREASTS. AFTER-PAINS. FINAL SURVEY.
PUERPERAL PYREXIA AND SEPSIS. MINOR PYREXIA.
PUERPERAL SEPSIS. TREATMENT.

At one time it was generally recognized that the period known as the puerperium consisted of the total number of days (10 to 14) which followed child-birth (lying-in period) and during which the mother was more or less confined to bed. As time has gone on, however, there have arisen various schools of thought with regard to the definition of the word, puerperium, and especially with regard to the duration of the period during which the mother should be kept in bed. It is therefore very difficult to give any exact definition, but it may be remarked that according to Leyland Robinson and others the immediate recovery from parturition has 3 phases: 1. a 48-hour spell of reaction to the actual ordeal of birth; 2. a phase of repair which may well occupy 10 days or more; 3. a process of involution which may go on indefinitely and indeed much longer than may be generally recognized. What was said about the effects of civilization in the previous chapter emphatically applies here: the fact is that after 10 to 14 days, the mother may be physiologically reorientated, but in many ways, as all doctors and nurses know, she may be far from normal in a purely physical sense. This must be kept in mind when the events of the post-partum period are reviewed, as they are in brief below.

Perhaps the most satisfactory way of surveying the puerperium is first to take the normal period as a whole and then to consider in more or less summary form the various abnormalities of the puerperium, especially puerperal pyrexia and sepsis.

The Normal Puerperium.

Regarded from the viewpoint discussed above, the puerperium

is indefinite. It is not too much to think of it as extending to 8 weeks, during which period full lactation is established and the maternal generative organs go through the process of involution, so that structurally they reach their normal; it should be mentioned however that the word, normal, in a parous woman has a meaning which is not the same as that referring to the non-parous woman. Mentally and functionally a woman may be unimpaired after she has been delivered of a child, but it is obvious that she is of different physical constitution in many ways; she has in fact been changed by pregnancy and parturition, sometimes on account of purely structural factors and sometimes on the physiological side. For instance, as long as a woman is suckling her child she is secreting milk; this very process must involve far-reaching physiological adjustments affecting many organs. Furthermore it is known that feeding the infant at the breast is generally associated with absence of menstruation; the sympathetic reaction of the hormones is clearly responsible and nowadays there is very little mystery about such matters. The whole natural plan appears to be to co-ordinate provision of infant nourishment with involution, a period during which the nursing mother is more or less protected from becoming pregnant by hormone control of the most sensitively balanced character. The main factors of the puerperium may now be discussed in order.

The Uterus.—Just after the child is born and the placenta safely removed the uterus is about 7 inches long and weighs about 2 lb. The upper limit of the uterus is roughly midway between the umbilicus and the symphysis pubis. Twelve hours after labour has terminated, however, the uterus has grown softer and the fundus is now at the umbilicus; this is a temporary phase, and the subsequent course of events is one of gradual shrinkage, which depends upon various factors—reduction of blood supply, retraction, diminution of bulk of muscle fibres and re-establishment of the normal endometrium—the combined effect of which is to make the uterus within 6 weeks 3 inches long and of 2 oz. weight. Measurement of the height of the uterus is therefore an index of retraction, and a daily reduction of $\frac{1}{2}$ inch is usual. After 7 days the top of the fundus should be less than 3 inches from the symphysis pubis; the womb at this time is about 1 lb. in weight. After the 10th day the uterus is not palpable in ordinary circumstances. When for any reason there is a hitch in the involuntary programme, the condition is referred to as subinvolution. There are many possibilities so far as delays in involution are concerned, and much depends upon the type of woman; the word, normal, can never be strictly applied to the interrupted or delayed involution that is associated with the fragile, weakly type of woman although the final effect may be quite satisfactory. In other words, as in all else, there is a law for each individual.

Breast feeding is advocated strongly when possible, especially as it is known to stimulate the uterus to contract.

The Cervix.—In a proportion of cases there is laceration of the cervix, but most women escape. The criterion of satisfactory cervical involution is that after 4 weeks the os should be of normal calibre. Needless to say the investigation is a matter for the doctor.

The Vagina.—In about a week after the end of labour the vagina has become very much less distended and the rugae are once more of firmer character. Coincident with this involution is the gradual strengthening of the perineal region, the flabbiness disappearing. But it is well to keep in mind that one of the effects of child-birth is permanent reduction of tone of the perineal and abdominal muscles.

Lochia.—For some 12 to 14 days after the confinement, there is a constantly diminishing discharge from the vagina. To this discharge, which is a composite one, the name, lochia, is applied; the constituents are in the main blood, serum, mucus and general debris from the birth canal, but mainly from the uterus and especially the placental site. It needs no stretch of the imagination to envisage that considering all the activities of the decidual site, including the growth of fresh endothelium, a substantial amount of liquid and debris must be discharged. In the first 2 days, the lochia (a plural word) are bright red in colour; there is also a fairly free discharge, which is in every respect a good sign. In the whole of the 14 days, the total loss does not generally amount to more than half a pint, but needless to say there are variations according to the type of confinement and the nature of the patient. The lochia are pink by the 4th day, consisting as they do in the main of mucus and serum. But a brown coloration begins to develop after this, indicating that certain degenerations are occurring, chiefly reduction of iron in the blood. The unpleasant, somewhat sweet and rather heavy odour of the lochia is distinctive; when the originally alkaline lochia become acid towards the end of the epoch—and thus akin to the state of the vaginal secretions—this odour disappears. It is most important to keep watch on the state of the lochia; this subject is dealt with again later on.

Management of the Puerperium

In the foregoing explanatory pages, nurses will have gained a good working knowledge of the general background of the puerperium. The subject probably of most interest and certainly of most practical value is that, however, which concerns the nursing of the mother in the first few weeks after the confinement. The following items must be considered in turn.

General Nursing.—It is again necessary to keep in mind that child-birth is physiological and not pathological when the event is normal. Nevertheless the mother is a patient and requires to be attended to not only on account of the natural sequelae of the birth but also on account of the great importance of disease prevention, especially with regard to sepsis.

The Daily Routine.—In many cases commentary need not be made, since the generally-trained nurse is qualified to deal with all the situations mentioned. First then, let us say that the mother is made comfortable after the child is born and she should never be allowed to become uncomfortable afterwards. Constant attention should be paid to the abdominal binder, to the diapers, to the bedding, to the personal clothing, to the heat and air of the room, to the diet, to the rest, to the sleep and indeed to every important point of hygienic interest which may affect the patient. Visitors must be carefully controlled. For the first 3 days at least only the husband, children or very near relatives should be allowed in the room and then only for 15 to 20 minutes. Recreation and occupational therapy are important in certain cases. The morale is always reflected in the child and fundamentally a moping mother does not provide good milk. The usual routine of attention to the excretions, washing and feeding is inevitable. The individual nursing procedures are dealt with below.

Antimicrobial Precautions.—There is no time at which cleanliness is nearer to godliness than during the puerperium. This is made all the more difficult by the fact that the aftermath of child-birth tends to make the aseptic plan more than usually difficult. Every possible effort should be made to keep micro-organisms out and to destroy any that may have found their way through the barriers. Sterilization of dressings and instruments is to be advised on all possible occasions. Efficient disinfectants and modern antimicrobial remedies should be used whenever there is the slightest indication for them (sulphonamides, penicillin and so on.)

Vulva.—The vulvar pad should be sterile and should be changed every 2 hours if need be; the procedure is one demanding strict aseptic routine, including the wearing of sterile mask, overall, gloves and so on. The toilet of the vulva is very important, especially after micturition and defaecation. Any swabbing should be done in a direction away from the introitus. The nurse may have to come to a decision whether to disturb the mother less and incur more risk of detriment on account of soiling of the pad, or to change the pad at frequent intervals and thus cause the mother some discomfort.

Bladder.—The bladder generally functions satisfactorily after a confinement, but in primiparae, despite all precautions, there is

apt to be some bruising of the urethra; in cases such as this a reflex spasm of the sphincter urethrae occurs and there is difficulty and pain in passing urine. All efforts must be made—heating of the perineum for example—to produce a normal act of micturition, but when all fails the catheter may have to be brought into use (see Vol. III, Section VII). Some authorities advise that the nurse, after passing the catheter and withdrawing the urine, should wash the bladder out with a 1 in 5,000 solution of potassium permanganate. Reactionary loss of tone of the bladder muscle is also a possibility and this is made more serious by the fact that often after a perfectly normal confinement there is increased renal action (possibly in an endeavour to get rid of waste products which have accumulated in the blood) and as much as 60 oz. may be passed in the first 48 hours; retention is therefore a serious matter. Catheterization is a simple matter, but in cases of retention from the above cause applications of heat to the perineum, or use of a hot bedpan or jug-douching may be tried in the first place. Quantitative estimation of the urine is not always possible, but in most cases a rough idea can be formed of the total amount passed in 24 hours.

Bowels.—Difficulty with defaecation is a well-known problem in the first days of the puerperium; any serious degree of constipation is to be regarded as a detriment to involution. The only condition in which constipation might be allowed to continue for, say a week, is that in which a laceration of the anus involving the muscle is under treatment. It is a long-established custom to give castor oil or suitable substitute on the 3rd day, the usual dose being $\frac{1}{2}$ to 1 oz. of castor oil. Mercurial or saline purgatives should be avoided, since they tend to have a bad effect on the secretion of milk. In the puerperium the threat of constipation is always present because not only is the mother denied a suitable amount of exercise but the muscles of the pelvic floor are not of their usual tone. For this reason it is advisable to administer a laxative regularly, although purgation should not be permitted. The most suitable remedies are preparations of liquorice, cascara and other mild aperients which will produce a soft stool but not a watery one.

Diet.—The main principles of dieting so far as the lactating woman is concerned are the provision of a diet with ample constituents as already discussed elsewhere in this work, vitamins and especially fluids being essential. Cow's milk and goat's milk are accepted by most authorities as most suitable forms of fluid nourishment, but it should also be kept in mind by the nurse that plain water should be a substantial constituent of the dietary. One of the best signs of the involutionary period is when the patient has a good healthy appetite and is ready for every meal. Various articles, as already mentioned in Section VIII, Chapter 6, are

especially beneficial and care should also be taken to eliminate sauces, pickles, any highly seasoned food, rhubarb and any other strongly tasting foods which are apt to affect the mother's milk.

Pulse.—The methods of taking the pulse need not be described again here. The nurse will no doubt concern herself with the rate of the pulse in the first place. This should not exceed 90 in ordinary cases; when the rate is above this figure it is time that every investigation were made of the local and general condition, the fact being constantly kept in mind that a fast pulse is the herald of a rising temperature. Needless to say, when the pulse rate exceeds 100, haemorrhage in the first 48 hours or sepsis at any time may be discovered. The pulse in the puerperium varies considerably, not only on account of the temperament of the patient but also because of various movements, e.g. in changing diapers. Lastly the nurse need not be alarmed when she discovers that in the first week of the puerperium the pulse may be slowed until it is more or less in the state of bradycardia, with a rate of 55 to 60 beats per minute; this has no special significance and alarm need not be caused.

Temperature.—The temperature is a very important register of local and constitutional health but it can well be imagined that, especially in the first few days, there are many minor occurrences in the puerperium, these giving rise to transient and small rises of temperature. There is no doubt about the septic type of temperature; what has been said about the latter elsewhere in this work equally applies here. Further on the subject of puerperal septicaemia is fully discussed, therefore all that remains to be said about temperature in the puerperium is that reaction after the confinement may raise it about a point, and sometimes irritability of the breasts or suckling difficulties, as well as obstinate constipation, undue pressure of the binder or pain at the site of a sutured perineum may give rise to anxiety because of slight elevation above normal. As a rule these small rises quickly disappear.

Sleep.—From every point of view sleep is to be encouraged as much as possible. Pregnancy is a long and anxious period, involving physical and mental strain which varies according to the individual, but at the end of it, when it would seem that all reserves might be exhausted, there is an intensified trial of body and mind, with severe pain and discomfort. The aftermath of all this is fatigue. Fortunately the lying-in period is very suitable for relaxation, and even in the most obstinate cases of insomnia as judged by the antenatal phase, sleep is not very difficult to induce after the child is born. When any difficulty arises about sleep, and when the nurse has checked various possible causes (noise, worry, anxiety, pain, discomfort, constipation, breast troubles and various other factors) and found that none of them can be

blamed, it is time to consider more serious occurrences such as approaching sepsis, puerperal insanity and perhaps concurrent systemic disorders. It is unwise to allow any type of serious insomnia to go on without having the opinion of the doctor. Ordinarily, soothing drinks at bedtime, e.g. hot milk, malted milk, "Ovaltine," "Benger's Food" or even a cup of weak tea may be productive of sleep. The nurse will not lose sight of the fact that getting the patient over to sleep is not the main problem; what is required is a good sound sleep of anything from 6 to 8 hours every night and freedom from restlessness, from waking up with full consciousness and an overactive brain at 1 a.m., and from unsatisfactory light sleep, with nightmares.

Posture.—This is a matter of very great moment to the patient; good posture in bed may be the foundation of a successful and uneventful puerperium. The whole subject should be surveyed in its widest vista; the facts are that the patient is



FIG. 151.—FOWLER'S POSITION.

destined to remain in bed for at least 10 days, not in any pathological state but in a state of recovery from what may best be described as an ordeal. Certain essentials must be provided: drainage, suitable conditions for maintaining the general muscle tonus, posture that will prevent the uterus from becoming retroverted, facilities for the performance of the excretory functions and for feeding the child. At various times special methods of taking exercise during the puerperium have been devised and

adopted as a routine. In most cases however, the activities of the nursing mother added to the attentions of the nurse provide ample exercise under the conditions pertaining to the puerperium.

Looking at the subject generally, rest on the back for the first 24 hours is the usual position to be taken. By lying flat, uterine danger is reduced, since the cervix is lower than the fundus; often there are perineal sutures to be contended with and in general the whole area of the pelvis requires to be rested. If need be, the mother can be put in the prone position with a pillow below her chest for one hour in the morning and one hour in the afternoon; as mentioned above this is a safeguard against unsatisfactory uterine drainage.

Usually, however, the position chosen for most of the day is the Fowler position, modified if need be according to circumstances. After the first 24 hours this position may be adopted as the basic one; any other movements or temporary postures are by way of being variations which are bound to have good mental and physical effect. Exercises for the legs and arms may be voluntarily carried out by the mother, provided the nurse approves of the character of the exercise and the time spent in doing it. Otherwise the occupation of the mother in suckling her baby, the movements involved in defaecation, in having the binder and diaper changed and in moving about so that the bed can be properly made are all variations in muscular movement and are beneficial.

The Binder.—There has been more controversy over this much maligned article of clothing or support or both than about any other appliance of midwifery. The use of the binder is traditional; modern science seeks to discredit its claims to usefulness. Whether the binder be merely of moral effect, however, it must be agreed that in the first rather flaccid days of the puerperium, this support to the trunk is very much appreciated by the majority of women especially those who have had several children. Apart from the points made above, however, there is little or no case to be made out for the binder after the first 3 or 4 days. In fact it must be agreed that a binder will tend to inhibit rather than to stimulate muscular action of the abdomen. This must be added: to put a binder on carelessly and improperly, so that it causes discomfort and discontent is a mistake that should never be allowed to occur.

Getting Up.—When should the mother get up for the first time after a confinement? This is a question that has many answers, since there are many schools of opinion. Certain obstetricians believe in, advise and can give perfectly good reasons for allowing the mother up on the 3rd day. Others stick to the old established rules of keeping the patient in bed for 10 days, then allowing her up for gradually increasing periods every day until she is up all

day on the 14th day. At the end of another week, she may be allowed to work at certain household duties. Actually the criterion of the fitness of the mother is her personal state of health; it cannot be dogmatically laid down that all women must follow a routine. Involution must not be retarded and fatigue and over-exertion may lead to delays; the ideal to strive for therefore is an amount of easy and beneficial exercise every day, none of this exercise giving the mother any difficulty, pain or anxiety, but in all respects allowing her satisfactory freedom and the realization that she has been able to accomplish something without making a special effort, naturally and easily. Only by this philosophy can exercise in the puerperium be properly explained.

Breasts.—Since the breasts are responsible for the provision of the child's food, it is obvious that they must be most carefully attended to. During pregnancy, as already mentioned, the general hygiene has been applied to preparation of the nipples and of the breasts themselves for the function they will have to perform, and little more need be added here.

So far as actual feeding of the infant is concerned, much depends upon the mother's constitution and the amount and quality of milk available. There is no doubt that there is a strong psychological influence on the mother, and all things considered—nourishment of the child, effect on involution of the uterus and maternal satisfaction and contentment—it is right that the child

should be put to the breast as soon as possible. It is generally the case that both breasts are functioning well by the 3rd day, therefore a robust baby will keep up with the production, but when the child is weakly and not inclined to take mother's milk, the breasts may become engorged and give rise to much physical and mental discomfort, often with an accompanying rise of temperature and increase of the pulse. It is wise to provide supports for the breasts anyway, but when there is engorgement, application of slings may be necessary and limitation of fluid intake resorted to. Milk may be drawn from the nipples by breast pump, the whole glands having been gently massaged with olive oil as a preliminary.



FIG. 152.—BRASSIERE FOR NURSING MOTHER.

(By courtesy of *Treasure Co., Ltd.*, London.)

When the child has been still-born or when it may have died shortly after birth, and also when for some reason, breast-feeding has to be abandoned, the breasts should be bound up firmly in fomentations saturated with magnesium sulphate in strong solution; as alternatives fomentations of hot sterile glycerine may be prescribed or glycerine and ichthyol in a thick application. Every precaution should be taken to ensure that the nipples are kept free from cracks or fissures, and any threat of mammary abscess should be at once reported to the doctor.

After-Pains.—After-pains are considered by some to be a sign of the abnormal puerperium, but in the case of the multipara they are of such common occurrence that they are to be expected in any woman who has had more than one child; the degree of severity varies. Since the cause of after-pains is irregular muscular contraction anywhere in the birth canal, the pain is felt mainly in the lower part of the abdomen, just above the pelvis. It has already been explained that the muscle tissue of the uterus never becomes quite the same as it was in the virgin state, and thus in the multipara it is to be expected that a certain amount of flabbiness or loss of tone will characterize the woman who has had 2 or more children. The pains are colicky in type; what is happening inside the rather irritable uterus is that clots are being formed but are not being expelled because the muscle is not working properly; the result is that an unusually powerful effort has to be made to get rid of such clots, with associated pain. When there has been a twin labour or excessive amount of liquor amnii (hydramnios) the condition may be accentuated. It is a sure sign of after-pains that they are set up when suckling of the infant begins or when the uterus is palpated or gently massaged through the abdominal wall; even restlessness of the mother may cause the pain to begin. One of the main reasons for administration of liquid extract of ergot is that it increases the tone of the uterine muscle and helps to get rid of the debris. When there is no rise of temperature and small if any increase of pulse rate it may be concluded that complications have not arisen. When after-pains persist despite ergot administration at the conclusion of the 3rd stage of labour, resort may be had to drugs such as pituitary extract, progestin and various other allied preparations, all given under doctor's orders.

Final Survey.—It is always the rule to have the mother and child carefully examined on the 21st day or a little later, so that the state of the maternal organs, the general fitness for nursing and the general constitution of the mother and child may be determined. Subsequently the mother and child may attend regularly at a postnatal clinic if need be.

Puerperal Pyrexia and Sepsis

The full story of puerperal sepsis cannot be told here, but nurses can gain a knowledge of the subject which will be sufficient for their needs. It is assumed that what has been said in the preceding volumes of this work about hygiene, bacteriology, asepsis, antiseptic measures and indeed the whole gamut of antimicrobial technique has been read and understood. This being so, the study of puerperal sepsis may be limited to the examination of the specific condition set up in the recently delivered woman by micro-organisms.

Minor Pyrexia.—Reactionary temperatures are to be expected in the puerperium; in the various chapters of this Section mention has been made from time to time of the factors which may cause slight elevations—fatigue, breast troubles, constipation, lochial abnormality and so on—but these are of minor importance, even although they demand full investigation, as compared with the very grave condition of puerperal fever.

Puerperal Sepsis.—It is difficult to know where to begin when explaining this condition, for in some cases the occurrence of puerperal sepsis is based on factors which are distant and not in close association normally with the obstetrical regions. Puerperal sepsis is defined as microbic invasion of the reproductive tract, the pathogenic organisms gaining access to the birth canal at any time in the puerperium but generally in the lying-in period.

Causes.—The great work of Colebrook and others showed that in the main, puerperal sepsis was caused by organisms brought to the patient and not necessarily harboured normally by the patient herself. The placental site and any of the other open areas of the birth canal are very suitable incubation beds for pathogenic organisms. It is true that the possibility must not be excluded of infection directly associated with the mother's actions (sexual intercourse late in pregnancy, putting the fingers into the vagina during labour, or harbouring bacteria of malignant type in the cervix uteri). But these factors are of minor importance as compared with the menace of droplet infection—a menace which threatens from all quarters and which according to reliable statistics may in respect of doctors, midwives, nurses or other attendants at a birth and afterwards, exist to the extent of 50 per cent of all cases of proved puerperal sepsis. The air and the dust in the air are potential sources of the organisms concerned. These organisms are not many—the haemolytic streptococcus, the anaerobic streptococcus, *B. coli*, the staphylococcus, *Clostridium welchii* and the pneumococcus—and by far the most sinister of the group is the haemolytic streptococcus. Although it is possible for any woman to harbour any or all of these pathogens in the genital

tract or its environs, it is mainly with the imported streptococcus that we must concern ourselves. Let us imagine that many carriers of this organism are regularly harbouring it in the respiratory tract, in the faeces or on the skin, and let us extend our imagination to the atmosphere, crowded as it well may be on occasion with spray from the saliva, moisture from the lungs and dust from bodies and clothing to mention only a few sources. The initiative is clearly with the micro-organism in the battle.

Symptoms and Signs.—The local lesions whether they be in lacerations of the perineum, tears of the cervix or vagina, abrasions of the endometrium or indeed anywhere near enough to give rise to general involvement of the pelvic or abdominal regions, are surely the most convenient mobilization centres for the bacteria concerned. No surprise need be caused by the occurrence of infections so easily spread; endometritis, salpingitis, peritonitis, cellulitis and lymphangitis of the pelvis, cystitis and even septic invasion of the veins (thrombophlebitis) are all to be expected in an uncontrolled case. The dreadful calamity of septicaemia and of pyaemia may end the invasion and the life of the patient too; sometimes indeed the sepsis does not reach these limits but causes death by toxæmia from a much more restricted area.

The reactions of the bacterial invasion are those of any septic fever and there is no need to discuss pulse, temperature or respiration. The process is very often rapid and intense. A very thorough examination should be made of the pelvic organs and even of the uterus, but these must be carried out by the doctor. All the facilities of the laboratory, as outlined elsewhere in this work, should be available in the search for the organism concerned.

Treatment.—Although the advent of the sulphonamides and of penicillin has revolutionized the treatment of puerperal septicaemia, it is nevertheless essential to consider the prophylaxis as well as the treatment proper from every viewpoint.

Prophylaxis.—Prophylaxis (preventive treatment) begins in the antenatal period. From what has been already said about the hygiene of this period it may be clear to the nurse that everything possible should be done not only to clear away any centrum of microbic concentration but also to render the mother capable of resisting micro-organismal attack by using her own antibodies. It should be borne in mind that puerperal septicaemia attacks those considered likely to be immune. Particularly is it necessary to deal with the teeth and tonsils, it being made certain that any potential lurking places for bacteria are eliminated. If it be more or less ensured that every leucocyte in the blood is armed with the maximum equipment for attack and defence, a substantial part of the preparation for the fight will have been completed. So far as the actual confinement is concerned, the ideal is that this should be regarded as a major operation with an atmosphere of

asepsis and certainly with the attendants in overalls, gloves, masks and any other type of microbe barrier. It is now considered that the examination *per vaginam* might well be given up during labour in favour of examination *per rectum*, by which the necessary information about progress may be obtained. Another precaution to be recommended is that the puerperium should be conducted on antiseptic principles.

Finally so far as prophylaxis is concerned, hospital routine must be referred to. Puerperal sepsis was at one time rife in old-fashioned hospitals, and it persisted even when every form of aseptic technique was introduced. In some maternity hospitals patients are classified as follows: 1. clean types—membranes unruptured, no septic foci; 2. suspect types—membranes ruptured, signs of potential foci. Class 1 and class 2 are kept absolutely apart. In cases of pyrexia the patient is admitted to the isolation block. Even the receiving room is kept in a state of disinfection, and every labour case admitted is dealt with by immediate and thorough antiseptics of the external genitalia. The use of "Dettol Cream" (30 per cent) or of "Dettol Lotion" (10 per cent) in the preparation of the patient for the labour room is widespread.

Treatment of Sepsis.—When there is no doubt as to the condition, active measures must be taken. First comes the use of sulphonamides—very carefully since there is a risk of setting up agranulocytosis, especially when sulphanilamide is used; the dosage is limited to a maximum of 25 grammes. Serum and vaccine treatments have also been used and surgical treatment of various appropriate kinds is necessary in certain cases.

All the above, however, must give place to penicillin. This remedy may be given prophylactically during labour and in the puerperium, 100,000 to 500,000 units being given daily for 2 or 3 days; it must be emphasized of course that the advent of penicillin does not alter the need for the aseptic technique. With regard to the use of penicillin in the fulminating case, there are 2 dicta: 1. give penicillin early; 2. give a large dose. The blood level must be maintained, so that subsequent doses of 100,000 to 200,000 units twice a day for 2, 3 or 4 days must be given. The drug may be given by continuous drip or by intramuscular injection at regular intervals.

It is hardly necessary to add in conclusion that despite the miraculous effect of chemotherapy and penicillin therapy, there is no reason for giving up any of the usual palliative measures, especially the general nursing procedures.

CHAPTER 7

CARE OF THE NEWLY BORN INFANT

MANAGEMENT OF THE NEWLY BORN CHILD. IMMEDIATELY AFTER BIRTH. STANDARDS. THE FIRST BATH. FINAL SURVEY. POWDERING. THE UMBILICUS. CLOTHING FOR THE CHILD. GENERAL HYGIENE. ACUTE DISEASES OF THE NEWLY BORN CHILD. OPHTHALMIA NEONATORUM. PEMPHIGUS.

THE first days of infant life are occupied as a rule with the gradual education of the child to the taking of milk from the mother's breast; when for reasons given at various points in this work there is no possibility of breast feeding, artificial feeding in one or other of its different forms may be resorted to. As the subject is dealt with fully in Section VIII, Chapter 6, it is not necessary to discuss it further. In this chapter, however, the common routine of infant life apart from feeding may be briefly reviewed and at the end reference is made to some of the ailments of the newly born infant which demand urgent treatment.

Management of the Newly Born Child

There is no need to discuss controversial points regarding the actual second at which life in the newly born child may be said to begin. Only the practical aspects of infant management concern the nurse.

Immediately After Birth.—Just after the body is expelled from the vagina, and while the circulation through the umbilical cord is still very active, the child does not give any indication that it is alive; in a few moments, however, and probably on account of the stimulation of currents of air and light, the first breath is drawn and the resultant expiration amounts to a cry. Thereafter, there is no doubt about the life in the normal child, for crying generally is brisk, and it is a good sign when this is the case. The child should be allowed to remain where it lies until the time comes for tying and cutting the cord. This is dealt with as already described in Chapter 5. The crying becomes more and more intensified as the infant becomes more and more used to the oxygen of the air.

Care of the Eyes.—On account of the danger of ophthalmia neonatorum (see end of chapter) it is essential to irrigate each eye socket with 2 drops of a 1 per cent silver nitrate solution or with a similar lotion such as "Argyrol". It is true that this procedure may be put off until the child has been bathed, but it is common practice to do it early; the eyes may afterwards be gently swabbed with boric acid lotion; it is a convenient time also for swabbing out the mouth, pharynx, and nostrils in order to get rid of mucus and other obstructive debris. All this having been done, the nurse may be assured that the infant has made an auspicious start in his life.

Standards.—It is wrong to judge an infant by any textbook tables or by comparison with another child. In the first place females are always smaller and lighter than males; the size and weight of a child are merely relative factors. If a baby weighs about 7 lb. and is about 20 inches long there is no need to worry. Incidentally the mother should be told that she should not judge her baby by its weight and size, but rather by its weekly progress in these categories.

General Appearance.—Experience of handling newly born children is a great help in determining the degree of its vitality. The plump body with its firm muscles and its ample covering of fat, which causes deep grooves at the joints, are the criteria of the healthy baby. The skin is covered to a varying degree with vernix caseosa which is white, but exposed parts will be pink and slightly mottled, especially on the facial aspects. As a rule the child soon settles down after its noisy beginning; very often it falls asleep and as it lies in its blanket it may be observed to be breathing regularly and quietly. Before giving the child its first bath, the nurse should be certain that in no respect is there any blueness of the skin of the body (indicative of heart or lung troubles) or leakage from the stump of the cord. Warmth is of the greatest importance, and it will be quite satisfactory if the baby be nursed at the fireside and in the charge of its grandmother who may be depended upon to look after it with all care.

The First Bath.—The mother having been attended to, it is time to deal with the infant's bath. The first bath is an event of importance. The clothes required will have been put over a chair at the fire or on a small clothes horse. Various items are essential to the bath; the list may be altered to suit conditions. A supply of soft paraffin or of olive oil, dusting powder, superfatted soap, soft Turkish towels (if obtainable) and flannel squares are all essential. A large sterilized dinner plate may be used for the scissors, cord ligatures, sterilized gauze lint or linen for the umbilicus, and safety-pins. A threaded needle will also be ready in a safe place.

The bath itself should be made of fibre or of enamelware; it

may be set on a low stool; and every household with obstetrics in its career will have a low nursing chair, an indispensable piece of furniture generally cut down from an original kitchen chair.

Preparation.—The nurse should disinfect her hands after leaving the mother. The water used in the child's bath should be at a temperature of about 101° F. and the bath should not be more than half full. There is generally some delay before the bath begins, so that the water may lose 1 or 2 degrees; in any case the bath thermometer should be used to test the water just before the washing of the child begins—it should be at about 100° F. A waste bucket should be handy for the general debris; when there is an open fire the latter may be used, but the bucket should be available nevertheless.

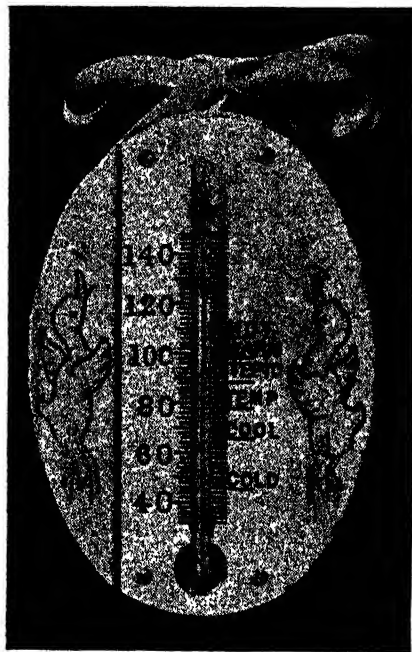


FIG. 153.—BATH THERMOMETER FOR INFANT.

(By courtesy of Treasure Cot, Ltd., London.)

used blanket or thick flannel square or Turkish towel. The child is then taken from the blanket in which it has been enveloped and is laid in the nurse's lap. Now is the opportunity to make a routine inspection for abnormalities, and the following conditions should be investigated: birth marks; accessory fingers or toes or other external deformities—e.g. talipes; imperforate anus; defects of genital organs; tongue tie. Many others may suggest themselves but these will inevitably be dealt with by the doctor in charge.

As the child lies on its back, a good opportunity is given to the nurse to ensure by careful inspection and testing that the umbilical stump is satisfactory; the slightest leak should prompt the nurse to apply another ligature, which is ready by her side. At

Giving the Bath.—Sitting on the nursing chair with the bath in front of her and flanked on both sides by chairs containing all the required things, the nurse should have a mackintosh over her knees and on top of it a

the same time any birth injuries should be checked and reported upon later to the doctor.

The first part of the bathing operation is the removal of the vernix caseosa. This whitish-yellow, rather sticky layer is of more than creamy consistency; the smell of it is easily recognizable; it sticks very closely to the folds of the skin. Since it is a mixture of sebum and epithelial debris it is not easy to remove unless olive oil or soft paraffin is used. Olive oil to the amount of about a dessertspoonful should be poured into the nurse's hand and then the whole of the child's body should be gently rubbed so that the oil reaches every part; some time must be spent on this, especially as the head is not easy to deal with. As a rule the oily mixture can be removed by cotton wool swabs, although sometimes soap and water are to be preferred. In any case it is advisable to lather the whole of the child's body as it lies on the nurse's knees with the special soap provided; a beginning may be made with the head, the water required being taken from the bath. In turn afterwards the face should be dealt with and the rest of the body from above downwards. The soft flannel cloth is used to rinse the skin, plain water being used finally. It is better not to rub but rather to dab the skin all over; the skin of a newly born infant is very sensitive.

These preliminaries over, and the accumulation of several months having been got rid of, the nurse may now ask that the bath be rapidly emptied and that fresh clean water at 100° F. be put in; needless to say she will use the bath thermometer once more as a test before the child is exposed to the freshly provided water. The child may then be put into the bath. The nurse should support the infant's back and head with her left hand, the thumb and index finger acting as a support; the other fingers support the back. The right hand is used to support the legs as the child is carefully lowered into the bath. Then steadying the body with her left hand, the nurse uses her right hand for the rinsing of the skin; here a small soft sponge is sometimes used. The period spent in the bath need not be more than about a minute, but during this time thorough rinsing should be done, care being taken to avoid injury to eyes or navel. When the child is carefully lifted out of the bath it is received into a warm thick Turkish towel which has been brought to replace the first (soiled) one while the nurse has been occupied with the bathing of the child. In drying the child, patting and not rubbing should be the rule.

Final Survey.—The skin now being entirely visible, a quick survey should be made; the palms of the hands and soles of the feet are generally of a deep red. The face cannot escape being blotchy and even wrinkled—this will right itself in a few days. The fine covering of downy lanugo is very prominent, and on the scalp the hair may be quite thick and long, although only for a short time, as the hair is likely to fall out after a few weeks and

to give place to the permanent hair. The hands may be clenched and the deep red of the skin may have a superficial whiteness like old blistering; this rights itself in a few days. Lastly the nails of the hands and feet should be examined; since they may be injured unless kept short, some initial trimming should be carried out.

Powdering.—The powder generally used for children is a mixture, very finely compounded, of boric acid, starch, talcum and zinc oxide in variable proportions. Baby powder is protective, soothing and drying. It should always be applied by dredger and the powder should be kept away from the baby's eyes. It should be rubbed gently into every part of the skin, especially the armpits, folds of the neck, groin and other grooves.

The Umbilicus.—The stump of the umbilical cord is destined to fall off in a withered state in about a week. Until it does separate however, it must be most carefully looked after for it is a potential site for the growth of pathogenic organisms. Sepsis of the navel should never be allowed to occur. One of the essentials is that the navel should be kept free of any liquid such as urine; for this reason the stump should be protected by sterile lint or gauze, a thick layer of powder having been applied first. Sometimes a hole is cut in the lint to allow the stump to protrude; the aim and object should be to insulate and keep the stump quite dry and covered, so that it may fall off like a dead leaf and without incident on the 6th or 7th day. Meanwhile the umbilicus is supported and any threat of umbilical hernia is counteracted.

Clothing for the Child.—There are as many different articles of clothing recommended for the child as there are outfitters. Only the fundamental patterns can be dealt with in this chapter however; the nurse will probably have to use her common-sense in making the best use of the things at her disposal. Meanwhile the basic necessities are briefly considered below.

Binder.—This is of use in the first week, but opinions differ as to its effect after one week. It certainly keeps the umbilical pad in position. It may be anything from $3\frac{1}{2}$ to 6 inches wide and is generally about 24 inches long; commonly, flannel is used. The binder is rolled and taken in the nurse's right hand and it is applied to the abdomen, beginning at the right flank, covering the umbilical dressing, passing over the left flank, over the back and so to the right flank once more; it is then passed across the abdomen and sewn with a few stitches at the left flank. Pins should not be used in any circumstances. Care should always be taken not to make the binder too tight and not to prick the skin with the needle.

Clothes.—The essential points in regard to clothing are: 1. it should be warm, light and of a material such as soft fleecy wool, which is a poor conductor of heat; 2. it should be loose, in order

that the infant may not be impeded in its movements, for the greater the chance of exercise, the healthier the child. The clothing, which usually consists of vest, petticoats and a dress or other outer garment are usually put on as the child lies on its face on the nurse's knee; tapes are used for fixation. It is impossible to enter into any discussion regarding the number, variety, quality, type or application of the infant's clothing. Every mother has her own ideas and her own way, and considering the amount of clothing or style thereof adopted by many, it is a consolation to reflect that the majority of infants have good resistance to such misguided coddling.

Napkins.—Perhaps the most useful article of the infant's wardrobe is the napkin; it is certainly the most hygienic and therefore the most important garment. Napkins may be made of many kinds of absorbent fabrics, but again Turkish towelling is the first in popularity and service; it should also be noted that Harringtons squares, made of soft absorbent muslin are generally considered to be less bulky. Some napkins may be destroyed after use, but as a rule squares of washable towelling are provided. Before a napkin is put on, the skin should be washed if need be, and powdered or lubricated with a little olive oil. A small square of fine gauze may be put over the anal region, but this is perhaps a refinement. The square of towelling, warmed at the fire and now folded into a triangular shape, is placed with its base well up the baby's back and its points stretching on either side of the loins; the apex thus appears between the lower part of the legs. The napkin should be applied as follows: the right point is brought over the right groin to enfold the genitals and it is passed underneath the left thigh and brought up towards the navel; the left point goes over the left thigh and groin, covers the parts of the right point and passes underneath the thigh to appear on the front of the right groin with the left point over the navel; the apex is pulled upwards to form the outer flap, thus covering the genital organs and the navel; the safety-pin may be put in to keep the points and the apex together and any loose points are tucked in. In some cases a safety-pin is put in on either side of the body. To cover the first napkin it is generally agreed that a similarly shaped napkin of flannel should be used. Later on waterproof knickers may be added.

General Hygiene.—Any further information on infant management may be obtained from full textbooks on the subject. In the Section which follows (Paediatrics) the hygiene and health of the growing child is discussed as well as the common ailments. Since the present Section set out merely to help the general nurse called out in an emergency to deal with a birth, no more need be said beyond what is enough to ensure the safety of the mother and the comfort of the baby in its first day of life.

Acute Diseases of the Newly Born Child

A child may be born with injuries, congenital defects, inherited disease and various other disabilities, but there are 2 conditions which are urgent and which demand prompt treatment. These are briefly considered below.

Ophthalmia Neonatorum.—It is with the prevention, rather than with the cure, that all in the medical world are concerned today. The preventive measures have already been reviewed and described, but it is advisable that all nurses should be made aware of the seriousness of ophthalmia neonatorum.

Definition.—The Central Midwives' Board has decided that ophthalmia neonatorum shall whenever possible be avoided, therefore it has described this disease as being any conjunctivitis, however slight, occurring within 21 days of birth. The true ophthalmia neonatorum is a gonorrhoeal affection and may be present in less than 10 per cent of the cases of infantile conjunctivitis. Nevertheless the menace is so serious that no matter how trivial the eye condition may be action must be taken to deal with the inflammation promptly. These strict rules apply for 3 weeks only, but it is safe to regard any conjunctivitis in a child under one year of age as of the greatest danger and to take action appropriately.

Causes.—The organism responsible is the gonococcus. In many cases the mother is the source of the disease even although she may not be aware of it. This makes treatment all the more difficult. The infection may have existed for a long time before the birth and may, indeed, have fulminated during and after the confinement. The child may be affected as it is forced through the birth canal, hence the great precautions taken to disinfect the eyes immediately the infant is born; but infection may also occur in the child because of handling by the mother. As a rule the hygienic conditions in the home call for much criticism and condemnation.

Symptoms and Signs.—If despite all precautions the child becomes affected there will be inflammation of both eyes, beginning when the child is 3 days old—sometimes earlier—and the signs are wateriness of the eyes, redness of the conjunctivae and edges of the lids, and swelling of the tissues in the neighbourhood of the eyes. A small bead of yellowish-white pus is generally to be found at the inner canthus in both eyes. In a serious case the eyelids will be adherent, the eyes unable to face the light (photophobia), and the cornea inflamed and ulcerated. Blindness is a common sequel. It is true that cases are rarely seen these days, but it is well to be aware of the worst that might happen. It should be remarked here that the moment any sign of eye inflammation appears, the mother should be examined, not only on account of possible vaginal discharge but also in order to see whether or not

there is evidence of venereal lesions such as warts or ulcers on the buttocks or in the perineal region.

Treatment.—As soon as possible the child and the mother should be put under treatment. The preventive measures need not be repeated here, but a word may be said about the modern methods of dealing with an established case in the child. The doctor must invariably prescribe the treatment. A bacteriological examination must be carried out as a confirmatory measure. The strictest asepsis must be observed in all the measures adopted.

By great good fortune the discovery of penicillin has revolutionized the treatment. This remedy can be obtained in ointment or in the form of eye drops. In the method advocated by Sorsby, 2 drops of a solution of penicillin (2,500 units per millilitre) should be put into each eye every minute for 30 minutes; the pus should be wiped away constantly and the swabs burned. Cure is almost certain in such cases.

Pemphigus.—This is the most serious skin complaint known to affect the newly born child. Again it is necessary to summon medical aid as soon as the lesion is recognized. The measures to be taken regarding asepsis and disinfection locally and generally cannot be minimized.

Causes.—Pemphigus neonatorum is an infection of the skin caused by the staphylococcus or the streptococcus. A certain proportion of pemphigoid lesions are caused by syphilis.

Symptoms and Signs.—Watery blisters are found suddenly; they quickly fill with pus in a few hours. A red ring is seen encircling the blister and there is obviously great irritation. In the syphilitic cases it is the hands and the feet that are affected, the palms and the soles being covered with blisters. The blisters occur in crops and tend to form one big vesicle, which when it bursts is likely to spread infection far and wide. It is quite obvious even to the lay person that the infant is gravely ill and indeed death is a common result.

Treatment.—Again the importance of disinfection may be mentioned. It is customary to segregate the mother and child, a special nurse being allocated to them. Various disinfectant lotions may be prescribed and ointments are commonly used in the attempt to contain the organisms and to dry the blisters. Sulphonamides and penicillin have not been as successful in pemphigus as in other diseases, but a substance, sterosan, has had good results in Switzerland.

after falls or other accidents, and the normal growth of the limb may thus be seriously interfered with.

Care of the spine is one of the maternal obsessions; all mothers instinctively protect the child's back in lifting it or turning it;

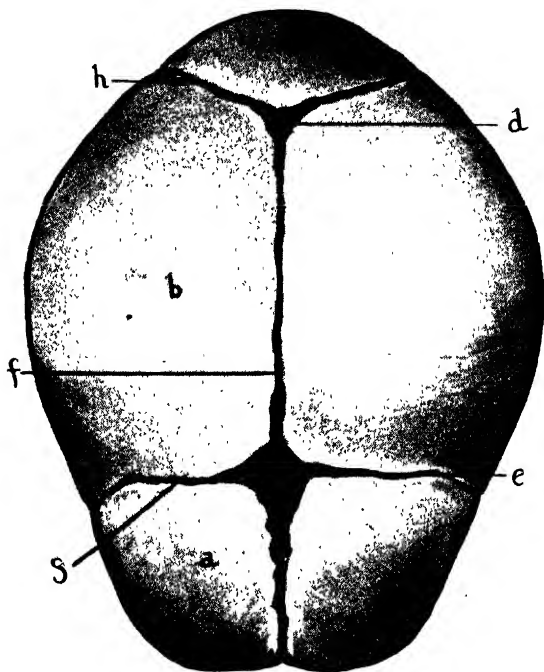


FIG. 154.—SKULL FROM ABOVE, TO SHOW FONTANELLES.

a, Frontal bone; *b*, Parietal bone; *c*, Occipital bone; *d*, Posterior fontanelle; *e*, Anterior fontanelle; *f*, Sagittal suture; *g*, Coronal suture; *h*, Lambdoid suture.

actually the spine is normally very strong and can tolerate a good deal of shock. As will be observed later on in this work, the closing of the anterior fontanelle is of major importance; in the early days the pulsation can easily be seen and felt, but there should always be a diminution in the pulsatile area; in the event of delay, the nutritional programme of the child should be investigated, for rachitic diseases may be at the root of the delay.

Circulation.—This is a matter for careful observation. The presence in the blood of a surfeit of erythrocytes causes the complexion of the child in the first few weeks to be of a dusky red, but very soon the normal colouring of skin, cheeks, extremities and trunk is assumed. The most important normal index of the circulatory system is the arterial pulse. In the first few hours after the child is born the heart may be irregular and the pulse imperceptible at the wrist. After about 8 hours the pulse can be estimated; it may be anything from 120 to 140 per minute, the average for infants up to one month being 135. The pulse can best be ascertained when the child is sound asleep, for it is well known that an infant is very reactionary to the slightest disturbance and the pulse may bound up after the child has been crying or when it is being suckled. In a child there is no need to use the radial artery as a guide; the fontanelles may show the pulsation clearly or it may be the best policy to lay the flat of the hand on the precordial area and count the beats of the heart itself.

Respiration.—It has already been said that one of the greatest tonics at an anxious time is the first cry of the child; absence of crying suggests weakness or actual collapse of the lung or lack of expansion of a portion. Any child who is found to be moaning or breathing with difficulty should be examined very carefully; it is a very bad sign. The newly born baby may not breathe regularly and the rate of respiration may vary from 40 to 60 per minute; within a few hours of birth however, the breathing becomes more soundly established—it is usually of the abdominal type. The respirations are more rapid during sleep but the rhythm is more regular. In an infant sensitivity to surroundings is always very great. Thus coughing may be set up by slight draughts or even by handling the umbilical stump in applying a dressing.

Digestive System.—In the routine investigation of the infant for abnormalities the opportunity is provided for examination of the mouth and tongue; the latter should be freely mobile and the mucous membranes of the mouth should be moist and glistening, with a healthy pink tint. It is well to remember that the infant's stomach will hold about one ounce only of milk; this may be kept in mind when feeding programmes are being made out; food begins to leave the stomach at once, and therefore it is clear that natural breast feeding is the ideal to which all should aspire, for by taking small mouthfuls at a time and being strictly controlled by the valve-like nipples of the mammary gland, the child is not permitted to gulp. The stomach of the infant is more of the nature of a spindle-shaped dilatation of the digestive tube and food soon passes on. This is one reason why great care should always be exercised in infant feeding and why the physiology of infant

digestion should be remembered, especially in the first 3 days of infant life.

Meconium.—When the child is born there is little in the alimentary canal, but a characteristic element of the first few bowel motions of the infant is the substance, meconium. This is a fluid of somewhat treacly character and coloured greenish-brown or green, mainly the latter; it is easily recognizable on the napkins. Meconium comes from the small intestine and consists chiefly of bile-stained mucus; it is, in fact, the debris of the foetal alimentary canal. Most authorities believe that meconium has the property of setting normal bowel action in motion and of generally preparing the rectum for its normal everyday work. Meconium has generally disappeared from the bowel and consequently from the stool by the 3rd day.

The Normal Stool.—Quite as important as bladder action is the bowel action. Nothing can be said of the motions until about the 5th day, when after some irregularity and perhaps difficulty, the bowel motions become approximately normal, that is to say there are 2 to 4 every 24 hours. The motions at this time are mainly of fluid consistency and there is a strong smell.

Urinary System.—The kidneys function very soon after the child is born. Quite a considerable amount of so-called urine may be passed, but it contains very little urea and on analysis may be found to be mainly water. The reason for this is that although a certain renal activity begins early in the foetal phase, the filtration process which normally acts on the blood to extract urea does not become properly established until the child has breathed. For this reason the analysis of the first sample of urine passed will show that the specific gravity is 1005 to 1010, the acidity very low and the colour pale straw. In the first few days it may be impossible to make any reasonable assessment of the micturition, for urine may be passed hourly or 2-hourly, but as a proof of the growing activity of the kidneys, the daily output rises from about 3 drachms per day to 1½ ounces per day in the first 3 days. Furthermore uric acid and urates may be passed by the 3rd day, traces of these causing faint pink staining of the napkin.

Nervous System.—The sensitivity of the infant has been referred to above, and there is no doubt that the human being begins life with a very highly efficient nervous system. It is true that the special senses of seeing, hearing, smelling and tasting do not seem to be fully developed for some months. On the other hand very slight changes in the environment, atmospheric and otherwise, cause the child to respond; it is, therefore, well to avoid any kind of disturbance; leaving of the child to its own instincts is commended by the psychologists. This is merely the old story of the adjustment of the organism to the environment.

It is true that coordination of the limbs is by no means perfect but this will develop in time, and the infant is the best judge of the exercise it may require; it wants food and gets it; it excretes waste regularly; it protests by crying when conditions are not to its liking. The cry of the child should be properly interpreted; the wet napkin, the coldness of the room or the improper digestion of the milk should all be considered in deciding as to the cause of the cry. On no account should crying in the infant be disregarded; often the strain which results from crying gives rise to umbilical or other hernia.

Standards.—The temperature-regulating centre must have a day or two in which it may become used to the various environmental factors. Infants should not be allowed to become cold, but on the other hand excessive heat is bad for them. The reading on the thermometer may vary from 97° F. to 100° F. during the first 6 to 7 days of infant life, but such readings need not cause any concern. There is also the matter of the weight; as is well known the weight drops in the first week, but this again is simply the index of the process of adjustment; considering all that happens in the first 7 days of the infant's life it is not surprising that loss of weight should occur; in normal circumstances regular additions to weight begin on the 8th day. The loss of the first week is very soon regained.

The Normal Child

Once the infant has been set on its course it should follow that course and should not deviate from it; in this way sound constitutions are built up. No two children are alike and there are recognizable differences between males and females apart from the anatomical characteristics. All this being allowed, there are also to be mentioned the various small deviations from the normal which may occur at certain periods of the child's career, most of which can be corrected and the normal course resumed. As a general rule, however, there is a sufficiency of normal standards to permit of a very sound assessment of the qualities and characteristics of any child at a given stage of its progress. Some of these standards may be examined now.

Influence of Heredity.—Space does not permit of any widespread investigation into the realms of heredity, but there is not the slightest doubt that good parentage is the main essential in the welfare of the offspring. Mendelism explains much of the mystery of the odd or unusual child and its principles may be studied by the nurse in her supplementary reading. There are various ways in which the influence of heredity may be demonstrated in the child and the better-known diseases known to belong to this class

are discussed elsewhere in this work: conditions such as haemophilia, syphilis, deaf-mutism, deformities of the limbs, spina bifida, congenital pyloric stenosis and cleft palate spring to mind. So far as immunity to microbic diseases is concerned, it is obvious that those who cannot fight the micro-organism must go down, and here the old story of the survival of the fittest appears to hold good. To sum up, therefore, it seems to be established that human beings are born with an index of adjustment to the environment and that health depends upon the type of that index; many authorities put less weight on the environment and stress that the good organism will survive and even benefit by its reactions in a non-suitable environment, although the latter will always be productive of satisfactory results when optimal conditions prevail.

Physical Development.—It is well known that for the majority of human beings there are 3 phases which seem to be constant and which characterize normal growth and development of the child. The main factor in promoting growth is the hormone to be found in the anterior lobe of the pituitary gland; less important, but indispensable, are the thyroid gland and the thymus gland, the vitamins and the constituents of the ordinary daily food. The fundamental growth of cartilage and subsequently of bone goes on according to plan, and growth of the skeleton stops only when adolescence is over and the terms, man and woman, can be applied to the mature human beings.

Certain factors interfere with development, although most of them should be regarded as diseases. Lack of proper nourishment is one of the first limiting factors which comes to mind, and infective diseases all tend to stop the normal progress of the child. When it is realized that one of the main reactions of an illness in a child is reduction in the rate of bone formation, which depends of course on the activities of cartilage, delay in development caused by illness is easily explained. Again defective metabolism causes a general slowing up of the machine which keeps the body going, and retardation is generally to be found. It is common knowledge that undersized adults often state that an infectious disease has been the cause of stoppage of their growth.

Despite all that is stated above, however, the normal child makes the 3 big spurts according to plan. The first is evident in the baby in its 1st year; it is observed to be making increasing progress, then there is a summit or peak and then a gradual slowing down. The elements of each phase are similar. Thus in the second phase which occurs when the child is between 6 and 7 years of age the acceleration is again evident and it ends with the loss of certain milk teeth and the acquisition of some permanent ones. Lastly there is the obvious grand transformation of boy into man and girl into woman, a process which may follow the pattern already given but which may vary by weeks or months according

to the person concerned; these phases need not be discussed—they are familiar to all and they have a complexity of signs and reactions which do not require to be dealt with at any length in the present Section.

Height.—As a rule the child in its first year adds about 9 inches to its stature i.e. if the infant at birth be 20 inches (which is the average) in length, it will be 29 inches at the age of one year. Up to a point both boys and girls add to their growth about $2\frac{1}{2}$ inches every year, but girls make a spurt at about the ages of 12 to 13; however the boys catch up with them once more at the age of 14.

So far as tables of height are concerned (and incidentally of weight too), the figures given must always be interpreted in the light of certain local or personal factors. These tables should, of course, be handy in any clinic, but unless they are used as a basis only they are apt to give rise to considerable anxiety on the part of the mother, for instance, who worries when she is told that the child is $\frac{1}{2}$ inch above normal in height and $\frac{1}{2}$ lb. below normal in weight. Needless to add, when a child is obviously much below height or much over height, much below weight or much above weight, investigations must be made; these will very often lead to the discovery of an endocrine gland defect.

Weight.—Assuming that the weight at birth is in the region of 7 lb., and that the losses of the first few days have been made good the child starts the 3rd week of its life with a weight of about 7 lb., so that from that time the regularity of the increases in weight may be noted. For the first 5 months, a maximum of about 8 oz. per week is the rule, the average being 7 oz. For the remaining 7 months there is roughly an increase of 4 oz. every week. From these well-known data there has emerged the often-quoted dictum: the child doubles its original weight in 5 months and trebles its original weight in 1 year. That is to say, an ordinary child may be expected to weigh 14 lb. at the end of 5 months and 21 lbs. at the end of 12 months. These figures are very often exceeded. The normal routine of weekly weighing should be carried out until the baby is 6 months old, then fortnightly weighing is to be recommended. Between the ages of 1 and 2 the weight need not be taken oftener than at monthly intervals. Growing children up to the age of 12 may be weighed quarterly. Although there may be temporary drops in the weekly or fortnightly totals generally put on, as a result perhaps of teething, change of surroundings, weaning or vaccination, these halts—nearly always temporary—should not on any account cause the mother to become panic-stricken. Especially in school-children the weight may show capricious variations according to season, environment, habits and so on. Once again the old problem of the reaction of the organism to the environment must be solved.

In fact, each child is a law unto himself and perfect health may be compatible with the spare figure in one and the substantial frame in the other. One thing is clear: the experienced doctor or nurse can generally decide whether the loss of weight or deviation from the standard is pathological or not. The weight must always be one factor only in the assessment of health.

Teeth.—The normal child at the end of the first year has 6 to 8 teeth, as already mentioned in Vol. I, Section I. Again the time of eruption of the milk teeth varies according to the individual, but as a rule the tables giving dates of eruption are a fair guide; when there is any serious departure from normal standards, some constitutional defect must be looked for, generally the feeding. This subject is discussed later on. The loss of the milk teeth and the appearance of the permanent teeth may go on at intervals from the ages of 5 to 21, and a guess at the age can usually be made by inspection of the state of dentition. Teething in a child is a normal procedure and in the first year or so, although certain disturbances of temperature and other reactions are grouped under the heading of "teething troubles," it must always be remembered that in the first year of its life the child has to be weaned—to be changed in its nutritional routine indeed very seriously—and it may be that many of the reactions are metabolic. Thus fever, vomiting, diarrhoea, cough, skin troubles and even convulsions are quite reasonably to be expected if only as evidences of initial sensitivity to new proteins, fats and carbohydrates. The whole process should be regarded as a syndrome, associated with the natural evolution of the child out of its babyhood, as will be evident when the subject is returned to later on.

The Excretions.—Control of the excretions can be brought about in the domestic animals and therefore it is not surprising to find that the higher intelligence of the human being is capable of establishing similar control. So far as micturition is concerned, this is not so easy at the beginning; the number of napkins to be washed and dried is the criterion of success. It is agreed by all that training should begin as early as possible, the aim being to catch the child in time and to put it on its chamber-pot. In some cases the child may be put on the chamber-pot at intervals, so that very soon some kind of reflex stimulation, based on an association factor, is set up and the bladder or bowels or both may be emptied. There is no period during which perseverance and patience are more demanded than in the first 6 months. In the second half of the first year the control may be quite satisfactory by day, but so far as micturition is concerned anyway, there is soiling of the napkin by night. Ultimately by the time the child reaches the age of 18 months it should be completely in control of its excretory functions, day and night.

Nervous and Mental Considerations.—In the human being the nervous system, including the organs of special sense, is ultimately developed to a very high degree of efficiency; the mind is *par excellence* the supreme factor in life which puts the human being so far above the other animals. It is to be expected that very rapid progress will be made in the first year so that general coordination, use of limbs (especially in walking), performance of fine movements and all the other attributes of the human nervous system will be in evidence and ready for further gradual development. With regard to mentality, there is an individual quality which contributes to the personality; it is quite impossible to predict how some minds are likely to develop. What is known, however, is that the basic mentality normally conforms to human characteristics and any gross deviations are apparent in the child who does not achieve the standards accepted as being normal in mental development. It is now possible to gauge the mental machine by the application of intelligence tests, the interpretation of which may be summed up by a quotient. This deals in the main with the average intelligence. The nurse in general training need not concern herself more than need be either with the infant prodigy or with the mentally defective; such types do not belong to the ordinary class and can either look after themselves satisfactorily or can be looked after by those prepared to deal with the abnormal, and thus specially trained for the job.

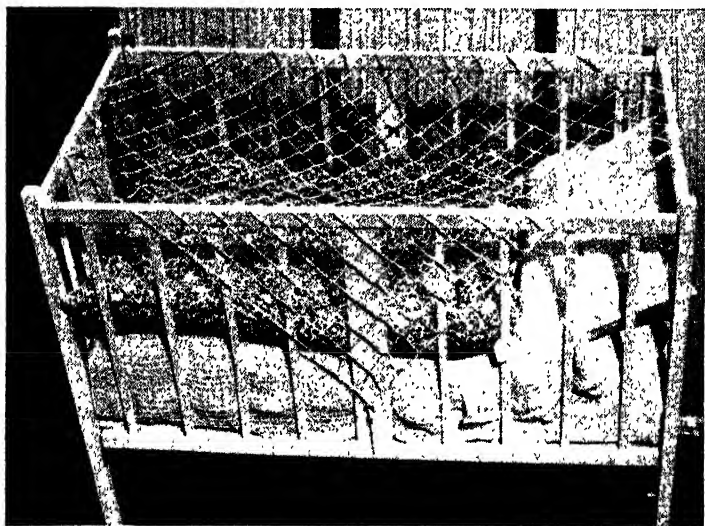
Nevertheless the highly-strung imaginative child, although in the group of average intelligence, and the somewhat dull and unimaginative child, similarly classified, have their special problems; they can both be made into good citizens and the task of education is to adjust each one to life in general so that it makes the maximal contribution and receives the greatest return out of such life. It is the duty of all responsible for children, whether the latter be sick or well, to interfere as little as possible with the pattern set for each one.

The Special Senses.—The powers of the special senses (in which for the occasion speech may be included) are developed very gradually. Hearing is fairly good from the beginning, but it is always well to remember that loud or sudden noises often produce serious reactions in the young child. It is difficult to come to a decision about the sense of smell. Probably the main special sense of infancy is the sense of sight. The eyes begin at the bottom of the ladder, so to speak; perception of light only is the standard pertaining to the first few weeks. Coordination is allied to sight, and recognition by looking towards the mother, for instance, as well as grasping and holding objects may both be possible before the child is 4 months old. A child left to itself will strive to hold articles, but if it is encouraged it will develop the faculty of using its hands—e.g. with toys, spoons, teething rings and the like

—from the age of 6 months onwards until it may well be able to use a spoon for feeding purposes—and successfully—at the age of $1\frac{1}{2}$ years.

Speech is most variable; some children are reticent, others talkative early. Very few simple words can be uttered by the end of the first year, and often difficulty with consonants persists for several years. Good hearing helps speech. By the time the average child has reached the age of 2 it should be able to understand what is said to it and to reply intelligently. Reading and writing may be attempted, often with success, before the age of 3, when the child goes to the ordinary school.

Walking.—Walking is an example of coordination and may be considered among the nervous and mental factors in development. Muscular coordination may begin early and is to be



(By courtesy of Treasure Cot, Ltd., London.)

observed when the infant is in its bath or as it lies kicking on the nurse's knee. As a rule the muscles do not begin to have any purposeful action until the child is about 6 months old, when it will be observed to be making efforts to sit up, this being the beginning of an era of movement which may add to the mother's responsibilities. In the latter half of the first year the child will usually try to pull itself up so that it may be in a semi-erect position supported by the bars of its cot; in many cases the cot has to be supplied with a net. Crawling is a feature of the last 3 months of

the 1st year; it is often an event of the 1st birthday that the child stands alone for the first time. Coordinated walking is not to be looked for however, until the latter half of the 2nd year. It should be emphasized that provided there is ordinary safety, the child should be allowed to fend for itself at all times; not the slightest harm can come of successful striving but there is danger of frustration by the interference of too protective attendants.

Sleep.—Lastly there is the question of sleep. It is agreed that the child should sleep for most of the 24 hours in the first few weeks, and, indeed, up to the 6th month its waking hours are not more than 6 per day. Sleep being the escape channel for those with tired brains, it is clear that a child is naturally intended for as much sleep as possible and it is by no means abnormal that a child should require about 15 hours in the 24 when it is a year old, about 13 hours at the age of 2 and anything from 10 to 12 up to the age of 5. Children vary in their requirements; going to bed should never be a tearful proceeding and should not be associated with delinquency, except of course when it is ordered at a time of day outside the usual hours. One important point is that even although a child may be bright and lively and not desirous of going to sleep it can, nevertheless, be undressed and allowed to look at books or play with toys, thus resting the physical frame.

Sleep varies enormously according to the individual and in all its aspects it is a faithful reflection of the individual concerned. As in adult life, there is the child that falls asleep quickly, sleeps soundly for a certain number of hours and wakens up, probably very early, with a bright outlook on life; and there is the child who takes some time to go over, who sleeps for many hours and who rises with reluctance. The fact that sleep is affected by excessive tiredness of mind and body (the expression, "past his sleep" must be familiar), by the ingestion of too much food and probably the wrong kind of food at bedtime, and by various conditions of the atmosphere, of the alimentary system and of the mind (excitement and so on) does not alter the premise that individuality of character and, indeed, personality, determines the nature of the most satisfactory sleep. It is, therefore, unwise to be too dogmatic. A healthy child, however, free from all the mundane responsibilities and worries of its elders, should not require any coaxing so far as sleep is concerned, nor should it be abnormal in any way as a result of sleep. If for any reason the child, young or older, shows evidences of irritability or other unusual sign first thing in the morning, the closest study should be made of its mind and body and an attempt should be made to correct any errors. We shall return to this subject later on.

Hygienic Factors.—All the hygienic principles referred to already in Vol. II may be applied to the child from the first day of its life. The importance of sleep has already been discussed, but

various other matters of hygienic importance must be reviewed—food, clothing, exercise and recreation.

Food.—The various chapters on food and feeding (see Section III, Chapter 10, and Section VIII, Chapters 6 and 7) already contributed to this work cover the whole subject of food, and all that remains to be added is that certain children may have likes or dislikes and should be allowed to choose their food as far as is possible. At the present stage of our studies we are restricted in our review by the purely normal healthy conditions, and at this point there is no need to discuss pathological states and the dietetics associated with them. Meals for children should be plain, good and varied; the occasional orgy of overeating that goes with the special occasion (e.g. the birthday party) is often an excellent means of intestinal or gastric cleansing which may follow the overloading process. Provided a child takes normal exercise, is active all day and comes in hungry for its meals, there is no need to worry about calories; with regard to vitamins and mineral salts, it is the duty of the mother to see that these are included in the menu.

Clothing.—As already stated in Section XII, the infant's layette is usually on the generous side; in fact there is still a tendency among mothers, even in the poorer classes, to apply layer after layer of clothing to the infant, the object being, of course, to produce warmth. The skin does not require all this protection, however, and furthermore, normal heat exchange and breathing may be interfered with and cramping of the limbs brought about. Clothing depends upon the climate and upon the season of the year. The child who is beginning to crawl requires to have its limbs free; various types of crawler or similar garment are very useful for such children. Ultimately the child who is able to walk wears the clothes according to its sex and it is surprising to find how little clothing is needed for an active healthy child from the age of say 2 until the age of 5. In winter woollen garments should be worn next the skin, and when the child goes out strong watertight shoes and overcoats, with scarves and woollen gloves if need be, are generally put on. Head covering depends upon the temperature, but in winter children should be provided with headgear that will keep out the cold and keep in the warmth. Shoes should fit well and must not be too big or too small for the foot. Children grow very quickly out of their shoes and it is advisable to allow for at least quarter of an inch of growth of the foot. The soles should be watertight, with the heels low and the toes broad, to allow the foot to be spread out satisfactorily. One of the greatest dangers to the child is damp feet, therefore in certain types of weather rubber overshoes should be put on, but a warning should be given that constant wearing of such footgear causes softening and coldness of the feet, with chilblains. The most satisfactory

shoe or boot for wet weather is an ordinary stout leather boot with a good sole, the whole of the upper covered with a greasy preparation such as dubbin, well rubbed in.

Exercise and Recreation.—All children find some way of playing and the extent of the satisfaction to be derived is dependent upon the amount of exercise taken and the facilities for games. Back-yard cricket may appeal to the child in the heart of the industrial area, whereas the country boy gets the same kind of satisfaction from the village green. Properly supervised and scientifically planned exercise is to be obtained as part and parcel of educational training in schools, whether such exercise take the form of ball games, gymnastics, physical training, dancing or many other different kinds of sport and recreation. Games should be played, not watched. The outdoor games played in the open spaces of town or country are ideal for health of both boys and girls; at the same time when it is difficult to gain access to parks it may be possible to obtain ample benefit from indoor exercises. Nor must we think of the physical frame alone. Recreation may be quite a mild business, but it may be health-bringing. Hobbies, sedentary games, occupation in some indoor work of a sedentary nature all may be quite satisfactory although of course, they may be successful from a mental rather than from a physical point of view. The value of fresh air and sunshine need not be enlarged upon again; it is one of the main themes of this work and is fully discussed in the Hygiene Section in Vol. II. Ultra-violet rays may provide artificial sunlight, and full advantage should be taken of the facilities available at local clinics and so on. Artificial sunlight must never be regarded as an efficient substitute for the natural sunlight, however, so much desired and sought by all.

CHAPTER 2

THE ABNORMAL CHILD

CONGENITAL ABNORMALITIES. GENERAL. ACCIDENTAL
INJURIES. MALFORMATIONS. INTERNAL CONDITIONS.
PREMATURITY. LOCAL AND SYSTEMIC ABNORMALITIES.
HEAD. HAIR. EYES. EARS. NOSE. THE MOUTH. THROAT.
FACIAL EXPRESSION. THE NECK AND CHEST. ABDOMEN.
THE LIMBS. SURVEY OF BODY. ABNORMAL STANDARDS.
WEIGHT, HEIGHT. THE TEETH. SLEEP.

If there does exist any condition which may be properly termed normal, very few human beings can say that they are in that condition; the many topics discussed in the previous chapter, as well as in Section XII concerning the infant, have referred to what might be better termed average standards rather than normal standards. In short if we say that the height of a boy of 8 years should be 48 inches, we do not mean that all boys of 8 should be of this exact measurement. What we mean is that from statistics collected over a long period and among different classes the average figure worked out at 48 inches.

The above paragraph is important because in this chapter, which concerns abnormalities among children, it is essential to know how much below and how much above normal indices we are allowed to go before we reach the region of abnormality. It may be said at once that a good deal depends upon the actual condition found in the particular child. It is often quite clear on examination whether there is an abnormality or not and it is therefore left to the skilled examiner to make his own decisions and to place the child in what is considered to be its proper category.

One further observation: all disease is abnormal, but the presence of abnormalities need not necessarily mean that disease is present. That is to say, apart from pathological lesions which affect the work of an organ, there are many abnormal conditions which do not interfere in any way with the work done by the bodily machine—sometimes indeed, such conditions improve output.

Certain abnormalities may be apparent when the child is born and others may not be demonstrated until the child reaches a

certain age. Each group, as distinct from the diseases which affect children at various ages, may be considered in turn.

Congenital Abnormalities

It was stated in Section XII that the nurse in attendance at a birth should rapidly but thoroughly examine the child's body for any signs of congenital defect or deformity; this is a simple matter as compared with the examination made for the purpose of discovering any internal abnormalities, and which requires the skill and experience of the qualified medical man or woman. Space does not allow more than a categorical description of the commoner congenital abnormalities; the more important of these are discussed elsewhere under various headings; subjects which have already been discussed in full in this work may also be mentioned merely in passing.

General.—Complexion, state of nutrition, attitude and general reaction to life may draw attention to certain congenital states such as jaundice of the newly born, which shows itself about the 2nd to 5th day and lasts for about 7 days; it quickly passes off thereafter without further incident. This must always be clearly diagnosed and is not to be confused with the condition known as icterus gravis neonatorum or erythroblastosis foetalis, to be seen unmistakably when the child is but a few hours old. There may also be abnormal swelling of both breasts (mastitis neonatorum). Occasionally bleeding occurs from the vagina, but it quickly stops; it is due to circulation of maternal hormone in the infant's blood.

Accidental Injuries.—Examination of the body may disclose injuries due to the birth process—bruises, fractures, nerve paralysis and other conditions. The normal caput succedaneum should not be confused with cephalhaematoma, which is the result of skull injury resulting from abnormal pressure.

Malformations.—These include spina bifida (incomplete spine), hydrocephalus (water in the head, the latter being very much enlarged), any of the conditions which because of gross malformation may cause the children to be referred to as monsters (they are rarely alive or rarely survive); hare-lip, cleft palate; hernia; club-foot (talipes); birthmark (naevus); congenital dislocation of the hip; imperforate anus; imperforate hymen; more than the usual number of fingers or toes; wryneck.

Internal Conditions.—The following may be discovered by the doctor; narrowing (atresia) of the oesophagus; congenital pyloric stenosis; intestinal obstruction; congenital disease of the heart; congenital obliteration of bile ducts; infectious disease, asphyxia livida; asphyxia pallida.

Prematurity.—The full-time child may suffer from the congenital lesions listed above or from accidents caused by parturition, but the child born before term, always allowing for possibilities of cause and effect of abnormalities, is in a different category. Prematurity is exactly as it is described—a great deal of Nature's work is unfinished.

General Description.—The premature child at birth has to be seen to be properly understood. Many premature babies die and even a certain proportion of those who survive bear permanent characteristics, internal and external, of prematurity. There is no doubt that when it occurs before a certain stage of pregnancy and despite the fact that the child may be viable, premature birth gives rise to dangers not only at birth but after it. Every vital organ is under the normal standard in reaction and performance. The child is feeble and obviously passive in its attitude—there is no vigorous response to the first breath of air. As a rule the nearer to the non-viable date the greater the weakness of the child, as might well be expected. The main functions of the body—heat regulation, respiration, digestion and various others—are not developed to anything like the full degree; consequently function is deficient everywhere and as long as the infant is alive it is a living picture of such deficiency. Half of the deaths occurring in the neonatal period (first 4 weeks) are caused by prematurity, and although here and there the exception proves the rule, nearly all prematurely-born children are prone to rickets, anaemia, infectious diseases and various other ailments which spring from a basically poor constitution.

It is now generally accepted that when a baby weighs 5½ lb. or less at birth and is known to be the result of full-time pregnancy it is immature; thus a full-time child may resemble closely the premature child and often the only means of making any distinction in the classification is by being certain of the conception date.

So far as the particular signs of prematurity are concerned, the infant is undersized, underweight and under strength. The relatively large head, the thin feeble legs, the pot-belly, the flabby slips of muscle, the constant weary cry which is more of a wail, are all common characteristics. One typical quality of the premature infant is its resemblance to an aged man. This is on account of the fact that the subcutaneous fat is very poor and consequently the skin is wrinkled and hangs down; furthermore the thinning of the face and the prominence of the malar bones add to the picture of senility.

Causes.—Unfortunately it has yet to be explained how at least half of the cases of prematurity arise. It may be that anxiety and worry have some influence, especially as it is clear that one of the known causes is maternal debility, often the result of malnutrition.

It has already been pointed out in the previous Section that the toxæmias of pregnancy may lead to parturition before full time. Multiple pregnancy accounts for a large proportion of premature children.

The Outlook.—There is a strong public interest in the premature baby and in the modern methods adopted to help it to become normal. The nurse may be asked about the prognosis in any case. It is elementary to say that size, weight and general response to environment are the criteria to rely on. The first 48 hours are critical and in this period there is no doubt that it is a question of the survival of the fittest; it may be said that when the mother is free from diseases such as syphilis and other serious constitutional ailments and when there is prospect of up-to-date feeding methods and good nursing with modern apparatus for dealing with the condition, there is a fair chance. There is little hope for the child that appears to be comatose and cold. On the other hand a child of 5½ lbs. if it be properly nursed and specially dieted will probably be up to the standard, or nearly so, of the normal child of its age when it reaches the age of 3. So far as mental development is concerned opinions differ so much that it is hard to make any remarks; it is true that certain premature children grow up to be pundits and equally true that some are backward mentally, with psycho-neurotic complexes.

Treatment.—From the nursing point of view, the premature infant demands everything that can be given; there is no limit to the attention that it may receive. When possible the nursing should be done in a specially-equipped room, with satisfactory arrangements for the supply of heat. In ideal conditions one nurse is in charge of the case and does nothing else; she may have part-time assistance. In a hospital it is possible to have cubicles of modern pattern and thus the optimal temperature of 70° F. may be maintained, although anything from 65° F. to 75° F. is satisfactory. One of the essentials is that the humidity or dampness of the room should be of a certain degree. This can be tested by the wet and dry bulb thermometer as described in Section III; 60 per cent saturation is the mean. The ideal nursing methods in prematurity are luxury methods so far, and very few hospitals have apparatus such as the specially-heated Hess bed (which is also an oxygen tent when oxygen is required). In most cases indeed, we have to be content by turning cots into improvised heating chambers, slinging hot water bottles on the sides, using cages over which blankets are draped so that the weight will not affect the child detrimentally, bringing heat to the cage by electricity or using electric blankets themselves. Special precaution should be taken against infection to which, as mentioned above, the child is very susceptible. The nurse herself should work as if she were in the operating theatre—masked, gowned and gloved if need be

—and she should see that all who come near the child, including the parents, are similarly protected too.

At the beginning the child may be so feeble that it may have to be wrapped in warm cotton wool and left undisturbed for

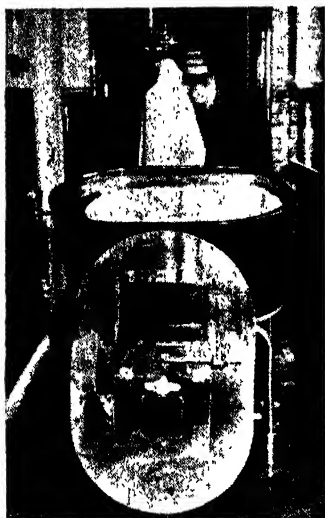


FIG. 156.—THE HESS BED : OPEN.

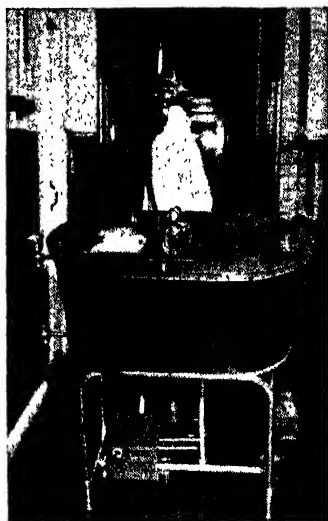


FIG. 157.—THE HESS BED : CLOSED.

(By courtesy of Hammersmith Hospital, London)

8 hours ; the less it is handled or interfered with the better, but it should be kept under close observation and in the event of there being blueness of the face or other signs of defective oxygenation of the blood and tissues, transfer to the oxygen tent may be necessary, a mixture of oxygen and carbonic acid gas being provided. If the child be still alive after 12 hours, some attempt, depending upon the individual condition and reaction, should be made to rub some olive oil over the surface of the skin ; the oil should be warm and the action should be very gentle ; warm squares of cotton wool should then be applied all over, and sometimes a little jacket is made of gamgee tissue, indeed in very difficult cases the child should be enveloped from head to foot in thick cotton wool until some more vital reaction is produced. Baths and other cleansing processes are out of the question. In the less serious cases, clothing conforming to the more orthodox patterns of infants' garments may be put on, the hands and feet being kept warm by woollen gloves and socks. There is no need for a napkin, any of the excretions being received on a square of cotton

wool covered with several layers of gauze; the child lies on this pad.

The nurse's other duties may include changing of the napkin of cotton wool regularly, giving of any nourishment ordered and ensuring that the position of the child is changed every 4 hours in order to prevent pneumonia. The great maxim is to disturb the infant as little as possible. When the temperature has to be checked the thermometer should be put into the rectum; readings between 99° F. and 100° F. are regarded as good signs.

Feeding methods and amounts are dealt with in Section VIII, Chapter 6, and need not be repeated here. It should be remarked

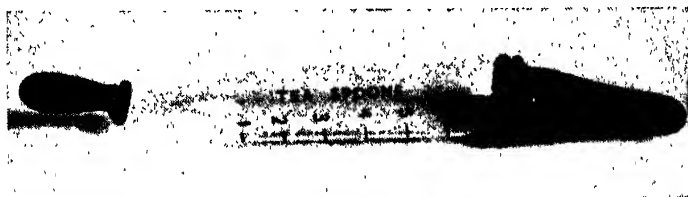


FIG. 158.—BELCROY FEEDER. FOR FEEDING OF PREMATURE INFANTS.

(By courtesy of Messrs. John Bell & Croyden, Ltd., London.)

that breast milk is most suitable, however, and breast pumping by electricity or by hand pump may have to be resorted to if the child should not be able to suck. As a rule however, breast milk has to be diluted; if the child should survive for 10 days it will be able to take full milk feeds 3-hourly. Feeds may have to be given by the nasal or intra-oesophageal routes, and here a No. 5 catheter or the Breck or Belcroy feeder is useful.

It is clear that early feeding of the right type is vital to the premature infant, and once it begins to absorb nourishment increasingly there is little difficulty in progressing towards the stage at which either direct breast feeding may be instituted or bottle feeding on ordinary lines may be resorted to.

Lastly, a word about the use of drugs. In the case of failure of the lungs to act properly or when the circulation is poor, intramuscular doses of nikethamide may be given (0.5 to 1.0 cc.m.) as well as oxygen. Dry thyroid extract has also been recommended. Vitamins and halibut-liver oil are of good effect; Paterson recommends 1 week of halibut-liver oil and 1 week of a solution of 1 grain of ferrous sulphate, the latter being added to a feed 3 times a day. The treatment should be begun in the 4th week.

Local and Systemic Abnormalities

In the routine examination of the child, as distinct from the infant, the usual meticulous survey must be made and notes taken

of any unusual occurrence. It is quite obvious that an enormous list could be compiled and it is necessary in this Section to limit ourselves to the abnormalities more commonly found. As before, those which are of especial importance will be dealt with later in the Section.

Head.—The head varies in circumference from 13 inches or more at birth to 21½ inches at the age of 15. Although a certain head may appear to be small, it may be only relatively small; use of the tape-measure will settle the matter. As a rule, however, the true small head (microcephaly) can be recognized; the mentality of the child may require to be investigated. On the contrary the huge head of the hydrocephalic child is distinctive. All heads are asymmetrical to some degree, but when there are bosses on the top of the head, with crossing paths between, and the head thus appears to be square, rickets may be suspected and its presence probably proved.

Hair.—The child of 6 months should have a good head of hair. When the hair is lustreless, brittle and dry, rickets and cretinism should at once suggest themselves. Any bald patches should be noted, since these mean alopecia or ringworm; sometimes impetigo raids the scalp.

Eyes.—The Mongolian type of eye shows the inner canthus very prominently and the eyes are narrowed; often squint is present. There may be heterochromia (different colour of iris). Although normally the infant tends to squint this passes off, but various kinds of squint often persist, and spectacles may be required for some years. Any movements such as nystagmus may be caused by rickets. Blindness should be recognized; when the child does not show any interest at all in a moving light after it is 4 weeks old, blindness is almost certain to be present. For various reasons the eyelids may not open, and in the condition which is occasionally found in the upper eyelid (ptosis) as a result of some inborn abnormality of the nerve supply, the difficulty of using the eye is obvious; care must be taken to eliminate another condition—oedema of the eyelids—which generally gives rise to temporary failure to open the eyelids and which is caused by acute inflammation, e.g. in ophthalmia neonatorum.

Ears.—The congenitally deaf child may not be recognized at once; sooner or later, however, it will be discovered that the hearing is not normal. In any doubt, examination by the aurist will ascertain what the condition is and an opportunity will be provided not only to make an examination of the ears but also to clear away any wax and to determine whether or not inflammation of the eardrum is present. The nurse should never be tempted to use a syringe in the infant's ears without instructions

from a qualified medical man or woman. In the event of there being no apparent temporary cause for deafness various tests may be made. Any sudden and fairly loud noise will cause the ordinary baby to turn his head or his eyes towards the source of the sound and, indeed, a noise does not need to be very loud to make a child cry with fright. Any child with good hearing will respond, however slightly, even to the quietest stimuli; many babies in their first few months will show that they like music for instance, and it is quite common for a child to show its pleasure when soothing words are spoken softly.

Nose.—More attention should be paid to the infant's nose, however small it may be. Apart from accidents, the nose may give rise to quite a lot of difficulty. The well-known sign of congenital syphilis—depression of the bridge of the nose—is as disfiguring as it is pathognomonic, and it must be realized that this condition has origin very early in life; it is the chronic discharge from the nares which soon rots the nasal bony structures and prevents any substantial development of the bridge. Again a child may have the typical facies of the adenoid type; as a result of long-standing obstruction at the back of the nostrils, mouth breathing is resorted to and there is not so much need for the wide open nasal canals, therefore the nostrils are pinched and narrowed—an unmistakable sign. Now and then this condition is found also when there is inflammation of any of the neighbouring sinuses. Another type of child which discloses the existence of respiratory trouble by the condition of the nose is the asthmatic child; here the nose has never had its full work to do and therefore it is generally a small and insignificant nose, which is well in keeping with the rather thin face. When a child is ill in bed with some serious respiratory complaint or even with a severe attack of fever, the respirations are increased very much, but in addition to this there appears to be some “pulsation” in the alae nasi; actually it is a to-and-fro movement of the nostrils, based on the excitation of the fine muscles which occur in this region; the action may be one of fanning in order to cool the ingoing air. This sign is seen *par excellence* in children (and in adults too) suffering from acute pneumonia.

The Mouth.—The region most obviously displayed is the outside of the mouth and very often the lips and the surrounding tissues draw attention to abnormalities, apart from congenital conditions such as hare-lip. Chronic nasal discharge may give rise to pimples on the upper lip and even on the cheeks. And what nurse is not familiar with the old friend that turns up regularly at the out-patient department—*impetigo contagiosa*? Very often the mouth is encircled by pustules, pimples and crusts, these occurring on both upper and lower lip skin surfaces. In pneu-

monia and in some other affections, herpes may be found, the small blisters giving rise to black scabs. The lips should be full, of good red colour and moist in health, but a sickly child will have pale lips and they are often dry and cracked. Congenital syphilis again takes its toll here; especially at the corners of the mouth there may be in early days open ugly grooves which do not heal well; they are known as rhagades and later on leave behind their monuments in the shape of white scars which may cause disfigurement; they should always be noted, since they are important evidence of the disease which gives rise to them. With regard to expression as displayed by the lips, the nurse interested in psychology will note tremors or tight closure, dryness or depression. Apart from emotional evidence, however, there are signs which go with congenital states, e.g. cretinism; here the lips are coarse and the mouth is generally open with an ugliness that cannot be fittingly described, since the very much overgrown tongue is protruded. When the lips are pale we must think of some kind of anaemia or microbic invasion of the blood; cyanosis of the lips may be prominent in children with congenital heart disease and, indeed, in any ailment in which there is defective aeration of the blood.

Throat.—Inside the mouth there are many possible conditions to be found. The tongue bears the usual evidences described already in this work. Carious teeth may obviously be giving rise to pyorrhoea and to gingivitis, and in any scorbutic condition due to vitamin defect (scurvy itself, perhaps) there is swelling and bleeding of the gums. Ulceration of the gums may cause intense swelling also; the teeth appear to be temporarily lost. Any further examination of the back of the mouth—e.g. of tonsils and throat—should be made by using a tongue depressor and torch. In children below the age of 7 to 8 it is generally necessary to have someone to hold the child's head and hands. The redness at the back of the throat apparent in early coryza, scarlet fever and other diseases may be visible, or the brief examination may disclose the presence of enlarged tonsils or even of diphtheritic patches.

Facial Expression.—Nurses may be reminded that the expression on the child's face may tell her quite a lot about the general condition and may speak of pain, suffering, anxiety or even grief. The bright alert eye and the frank facial attitude are not necessarily the only signs of good health. A very common belief is held that the child should be rosy-checked and of fair complexion, but although these may be good Nordic characters, it is quite possible to have perfect health in children with swarthy skins or in those comparatively pale because their hair is very dark. It should be remembered that the thickness of the skin may affect the complexion. There is a certain type of complexion

which goes with the tuberculous diathesis; the hair is copper-auburn, the skin is rather milky in colour and unduly soft and freckling is common; the eyes move rather lazily and are generally brown; any suggestion of a T.B. focus in a child of this type should be investigated thoroughly.

Undue thinness of the face should suggest metabolic or nervous abnormality. In rickets the muscles are very sensitive and react by slight tautness when the face is tapped; this is known as Chvostek's sign. The child affected with threadworms generally has a thinned face, the condition exaggerated because of the dryness of the skin. Infantile marasmus has already been referred to.

The Neck and Chest.—For the examination of the neck, the child should be placed in a good light, the baby on its mother's knee, the older child able to stand stripped to the waist. Asymmetrical conditions such as wryneck will be at once apparent as also barrel-shaped chest or spinal distortion. Sometimes because of an accident at birth there is a haematoma of the sternomastoid muscle. This swelling generally passes off especially when massage and other kinds of physiotherapy are used, but slight wryneck may be left. A rickety chest may show itself by being deformed, but generally the well-known "rickety rosary" may be recognized by running the fingers down the chest at the points at which ribs and costal cartilages meet; the beads will be prominent. Another sign of rickets is known as Harrison's sulcus; the sternum appears to have been sucked in and forms a groove. One of the most important factors in dealing with the growing child is postural defect; this is generally caused by bad habits, lack of exercise of the right type, eye defects, overgrowth and many other things. In any case the matter should be fully investigated and corrective treatment applied. When the child is ill in bed, and obviously affected with meningitis or similar disease, it will likely adopt the posture known as head retraction, the occiput being buried in the pillow and the lumbar region arched. Any stiffness of the neck should be noted (apart from already recognized glandular inflammation, mumps, tonsillitis, carache, toothache, and other obvious signs) for sometimes diseases such as poliomyelitis begin that way.

Abdomen.—It is not always easy to say what the external appearance of the abdomen should be, since most children up to the walking stage have an unusually prominent abdomen whether they be overfed or not. Once the child has learned to walk and has assumed the upright position, the pot-belly state tends to disappear. In any child over the age of 2 years undue prominence of the whole or part of the abdomen should lead to investigation of metabolic disorder, coeliac disease, poor carbohydrate digestion, enlarged liver, enlarged spleen, bowel obstruction, dilatation

of the colon, constipation, ascites (in tuberculous peritonitis), tumours of the kidney and distended bladder. Investigation with regard to hernia in both boys and girls should be carried out with the child stripped fully and standing in a satisfactory well lighted place. In the male, phimosis or undescended testis may also be investigated.

The Limbs.—Deformities of limbs may be of rachitic origin, especially bow-leg or knock-knee. The child's walk has also to be investigated; if the body should move from side to side in exaggerated fashion (waddling gait) there is probably congenital dislocation of the hip or certain muscular defects. Stiffness or pain in the joints (e.g. in the knee) should suggest early tuberculosis, especially when these symptoms are complained of at the end of the day. Needless to say the various bruises and sprains of the robust life have also to be eliminated.

Survey of Body.—Looking at the body generally the nurse will be able to note general asymmetry and to identify any of the common skin diseases or rashes by a survey of the skin. Pigmentation or jaundice may also be recognized. One important investigation may be done: examination of the glands. As is well known the important groups of glands draining the neck, the chest, the arms and the legs are to be recognized even in health in the case of the neck, axilla and groin. In German measles there are distinct but small nodules at the site of the occipital glands. Any serious inflammation of the hand or arm will show reactionary hard, swollen and often tender glands in the axilla, and similarly when the lower extremity is affected the glands in the groin will be involved. Glands varying in consistence and size from that of a hard pea to that of a soft plum may be found in the inguinal region, and may be caused by venereal disease—syphilis or gonorrhoea. In certain thin children it may be possible to examine for enlarged abdominal glands which generally indicate the presence of tuberculous peritonitis or even a neoplasm. In dealing with the external groups of glands too, the possibility of Hodgkin's disease must be kept in mind.

Abnormal Standards

In Chapter I the normal standards of health were summarized and mention was made of the wide limits allowed by the governing factors of good health. Now, however, some consideration must be given to the child who shows gross deviation from the normal standards and who must, therefore, be regarded as being in a pathological state.

Weight.—When a child is obviously under the standard weight or is known to be losing weight over a certain period it is

time for him or her to be watched carefully and in the first place a thorough examination is indicated. As a rule temporary but easily cured loss of weight is to be found in children who suffer from threadworm infestation or adenoids; these conditions rapidly right themselves when the cause of the emaciation is eliminated. Some children, especially those of highly strung, imaginative or studious personality, worry over examinations at school or become exhausted nervously because the mind may be growing more quickly than the body; such conditions are not dangerous conditions, but they tend to weaken the constitution generally and may cause difficulties—for instance at puberty. The rheumatic, diabetic or tuberculous child may, of course, become thin as a result of the debilitating process actively at work in the general protoplasm everywhere in the body. The loss of weight here is in relation to the strain put on the body so that the fundamental metabolism may be kept just up to the necessary level in face of all the difficulties encountered as a consequence of the activities of the toxins in the blood. For this and other reasons increase in weight in the diseases mentioned above is almost invariably regarded as a good sign.

As a rule in examinations of a series of children over any period it will be possible to define, apart from predominant diseases altogether, 3 main classes : 1. the more or less normal child so far as weight is concerned ; 2. the fat child ; 3. the thin child. Let us examine classes 2 and 3 more closely.

The Fat Child.—Obesity in a child varies according to age, race, disposition, habits and many other factors. It is obvious that certain obese conditions are frankly pathological and many other signs will be evident to make a diagnosis possible; for instance in cases of pituitary abnormality fat may accumulate in the body and become overwhelmingly prominent. Diseases such as these have already been referred to and are mentioned later. In our present survey we must confine ourselves to the obesity which Paterson in certain types is content to regard as functional; he instances the Jewish child between the ages of 8 and 12 who "absorbs and stores up fat." The trouble is that it is not easily disposed of; because of the burden of obesity the child is not inclined to take much exercise and develops sedentary habits, thus maintaining the obese condition. Furthermore the condition of flat-foot supervenes and may, indeed, put the child "off the legs" as the saying goes. In any school, there is always the fat member, who may be the butt of his fellows, but his good nature generally saves him from psychoneurosis. Many of these fat children lose their superfluous tissue at puberty but some may retain a certain amount until they are in the twenties.

Girls are fatter than boys, this tendency to accumulation persisting all through life as a feminine characteristic. The distri-

bution of fat on the body should always be investigated since it gives valuable data. In the boy there is a tendency towards accumulation in the region of the breasts, whereas in the girl the fat collects especially on the hips and shoulders. One important point should be noted: the child who is fat is rarely undersized—on the contrary, so far as height is concerned he is usually several inches taller than the average standard for his age. There is no doubt that parentage has something to do with the fat child, fathers and mothers or at least one parent being clearly adipose. Incidentally, it should be understood that many a very stout mother has been observed at the out-patient department leading in a very small and very thin child. As a rule obesity begins before the age of 12, about one-third of the obese children having been fat from birth, one-third having a history of fatness beginning at any time in the period 4 to 7 years and one-third having assumed the extra fat between the ages of 10 and 12. As a rule, however, obesity comes to the notice of the doctor when the child becomes more conscious and more sensitive about the mental and physical discomforts; in addition to this the approach of puberty has its effect on the child as well as on his parents; the latter begin to regard the obesity with some doubt, whereas before they had been content to think of the condition as plump health. Remembering that we are dealing only with the case of so-called "functional fatness," it is well to keep in mind that on account of some stimulus to growth, the bones may be in a more advanced state of maturity than would be expected for the age. Obesity in a child does make him look younger and less mature than his years, but, for instance at puberty, the sexual organs may be found to be properly developed although the accumulation of adipose tissue in the abdomen and the thighs may cause the organs to appear to be small.

It is essential to make sure that in any case of obesity there are not any primary diseases (see above) causing a secondary accumulation of fat. The treatment resolves itself in uncomplicated cases to reduction of the diet especially so far as fats and starches are concerned (see also Section VIII, Chapter 8). This is a serious matter for the school-boy with an appetite for sweets, sugar, bread and butter, jam and potatoes, all of which must be reduced. Fruit, meat, vegetables such as cabbage and spinach, may be allowed and liberal quantities of water. What is wanted is an ample supply of vitamins and mineral salts, but there must be a reduction in calories; the usual tables should be consulted in the making up of the daily menu. On no account should the restricted diet be allowed to be considered as a punishment or as anything to do with bad health, otherwise psychoneurosis may be developed. Exercise should be planned with care; there is no question of emulating the boxer and going in for hard skipping to get down

so much weight per day. It must be remembered 1. that the child has become a very sedentary animal; 2. that he or she therefore is soft and out of condition so far as the muscles are concerned; 3. that the very fact of reduction of diet is a cause of serious strain on the whole body and that strain must not be intensified. As time goes on exercises should be increased and games encouraged. The value of swimming is to be emphasized because the fat child floats easily and therefore the limbs can be used for fairly long periods in the water. If there are any joint defects, special shoes may have to be fitted. With regard to administration of drugs, no doubt the doctor will consider a course of thyroid gland extract in gradually increasing doses; in appropriate circumstances, when there may be retarded sexual development, "Pregnyl" is generally prescribed. But the essence of the treatment is the collaboration of the patient who, when he or she is sympathetically dealt with and told the whys and the wherefores, is most likely to obtain the speediest relief.

The Thin Child.—The mother may not have urgent promptings in taking the obese child to the doctor but when it is a question of the child being too thin, she will consult him at a much earlier stage in the condition. As already mentioned, parentage has a certain amount of influence on the constitution of the offspring, but again the thin child may have an obese father or mother or both. If a child be thin by nature and inclined accordingly to be restless, active and highly strung, there is no reason why he or she should be regarded as in any way pathological. If the personal adjustment of the organism to the environment be satisfactory there is nothing to be done. In the case of the thin child, however, certain questions must be answered before it may be concluded that there is nothing abnormal in the metabolism. These refer 1. to the state of the child say in his first year and to plumpness which may have gradually given place to a state of the body bordering on emaciation; 2. to the presence of any initial disease of which the thinness is the sequel; 3. to the weight of the child in previous years and whether the records show that he has always been well below standard although constantly growing heavier. The answering of these questions involves a long and patient investigation.

One of the basic facts to be ascertained is the calorie intake per day; this may be affected in two ways: 1. the mother may not be giving the child enough food (there are many sides to this, all requiring to be probed); 2. the child may not be eating enough although enough may be provided. As in studying obesity, let us put aside the main organic causes of thinness, for once the primary diagnosis is made the rest is simple. Let us eliminate the premature child, the adenoid child, the asthmatic child; the child with tuberculosis, diabetes mellitus, rheumatism, nephritis or gastric trouble.

This leaves for investigation and discussion the type of child so well known to all, especially doctors—the nervous, highly strung boy or girl—more commonly a boy—who is thin by heredity and constitution and who, as the mother may remark “lives on his nerves.” Now although this type of patient may be the replica of his progenitors, he will give rise to the greatest amount of anxiety; furthermore the undue attention paid to him to try to induce him to eat more is psychologically very bad for him and tends to intensify his neurosis. The result is that by the time he reaches the clinic or the doctor’s consulting room he is in a very complex state. This type of child is to be seen more and more commonly and it may be that he is a product of a generation that has seen too much of war. It must not be forgotten that the organism may be good—his parents are always very intelligent and often intellectual—and therefore the conduct of the case is all the more important.

In dealing with the thin child it is well to remember that it is an engine that tries to take too much out of a restricted supply of fuel. In well established cases it is questionable whether the child could assimilate any more than he takes; many of the thin little boys suffer dolefully after initial efforts by country aunts at feeding them up on eggs, cream, butter and all the farm products to be had. The child becomes sick; when the stomach cannot deal with the food there is pain and vomiting; if the food should get beyond the pylorus there is drastic bilious reaction or establishment of an acidotic state. To be angry with a child of this type is to be cruel; much harm will be done to his already injured sensitivity.

In the treatment, therefore, it is advisable to deal most gently and sympathetically with the patient, gaining his confidence first and assuring him that there is no question of treating him like the Christmas turkey. The first thing to do is to relieve the strain on the engine. More rest and more time to be taken over every action should be the regime. Translated into practicalities, this means that the child should be told to lie in bed until just before breakfast, to go to bed earlier than usual, and to lie down for an hour after the midday meal. Resting means resting, not playing with toys or games which require the patient to sit up or to balance himself. Reading may be allowed and pillows may be arranged to support the patient in the reclining position. With the load relieved, the body will have a chance to make good its losses by having more reserves built up from the ordinary intake. Gradually the menu can be increased and the calories added to, and once the vicious cycle is broken the patient begins to put on weight. It is questionable whether he is ever likely to become less highly strung for that is his intrinsic quality and unalterable in the main. He can, however, become used to a certain routine

which amounts to discipline and can, therefore, be saved from himself until he is able to make his own adjustments to life in general.

With regard to drugs, there is no elixir that will make children fat. A thin little boy will never become reconciled to cod-liver oil and malt, halibut-liver oil or any other oily food. He will eat sugar however, and thus sugary foods, including sweets, should be prominent in the menu. He may be given glucose as a drink; flavoured with orange or lemon.

Height.—Growth in stature is sometimes associated with obesity, as mentioned already, but so far as simple tallness or simple shortness is concerned, these conditions rarely bring the child to the doctor; it is true that certain dwarf states clearly related to primary glandular defects and, at the other extreme, gigantism, equally dependent upon endocrine defect, reach the doctor's consulting room from time to time, but as in dealing with weight such abnormalities were put on one side, so in the case of excessive height or deficient height, we must judge the case at the moment purely from the viewpoint of the abnormality. Undoubtedly the large boned skeleton depends on heredity and it must not be forgotten that Mendelism has explained why an oversize boy or girl may be the offspring of small parents. Unlike weight, height cannot be controlled; all that can be done is to make some adjustments for the abnormality. In the case of dwarfism pure and simple and without reference to those who are stunted and starved, again it is a question of careful review and of providing ample exercise, fresh air and recreation in the effort to add a few more inches. Needless to say, general poverty of physique which comprises both dwarfism and deficiency of weight must be dealt with by entire change of environment and by complete reorganization of the food, habits and routine of living of the patient concerned—if and when that can be arranged.

Gigantism.—As mentioned above, gigantism belongs to the realms of disease, and is, therefore, a pathological type of abnormality. It is now known that states of gigantism are caused by some abnormal condition of the pituitary gland (anterior portion). Otherwise overgrowth may be due to certain defects of the sex hormones; now and then children come obviously too early to sexual maturity; in such cases adrenal gland tumours and defects of the gonads may be looked for.

Dwarfism.—When it is quite clear that the child is to be a dwarf, and when defective height is clearly proved not to be an inherited trait, the skeleton will show defects in growth. Various well-known diseases affect the bones, especially achondroplasia, in which the patient is very short in the limbs and clearly thick set. But when any child has a puny look and is generally below

standard, the history may prove that his defects are due to acquired diseases such as rickets or caries of the spine. In other cases the gonadal tissues may have begun to function too early or in an abnormally active way; this tends to stop growth at the epiphyses of the bones. In the case of infantile paralysis the whole picture is so very clear that the cause of any defects of stature is not in any doubt.

Infantilism.—The difference between dwarfism and infantilism must be recognized. Infantilism is mental as well as physical. There is an overall lack of normal development and progress; the most notable feature is, perhaps, the head, which appears to be too big for the body. There is no real puberty, and the childish mentality persists. Many causes may be considered in the diagnosis—endocrine, maldevelopment, congenital syphilis, rickets, kidney disease, coeliac disease, congenital heart weakness, tuberculosis and poor feeding and bad home conditions generally.

The Teeth.—There are allowable variations in the standards of dental activity, and although it is known that in the first 2½ years the milk teeth erupt according to a time-table, the latter may be inapplicable in certain cases. Nevertheless, it is advisable that nurses should always make careful investigation when there is evidence of very late eruption, or defects in the milk teeth or unusual caries. It cannot be over-emphasized how very important is this matter of the child's teeth. Early decay is not only a sign of deeply seated general debility, but it is also an indication that the dietary is lacking in fundamentals, especially mineral salts and vitamins.

Allowing as usual for hereditary peculiarities and the minor discrepancies of the individual so far as the normal dentition is concerned, there is a point at which the condition of the teeth, whether it be one of delayed eruption or of disease or other imperfection, demands close attention. All nurses must be familiar with such cases. There is no need to dwell on the sequence or dates of eruption; this has already been dealt with elsewhere, and in any case data regarding cutting of teeth are generally available on cards or other easily accessible wall-charts. The examiner must decide for herself whether or not there is a degree of delay in eruption of teeth that is long enough to constitute an abnormality. But once it is certain that the condition is abnormal, speedy action may be required to rectify the situation. The mother will generally take the child to the doctor in the event of the dentition being delayed or irregular. One of the first things to be thought of is rickets, and apart from the teeth there will be much to suggest its presence elsewhere. In addition to irregularity of shape and size of the tooth, the latter will be found to be brittle, easily broken and obviously a centre for microbes, as the black and ugly patches will confirm. When this picture is presented, the

need for ample sunshine, fresh air, good plain nourishing food with vitamins and in many cases an entirely different routine at home, is clear. Regular doses of cod-liver oil and malt, vitamins in other forms, halibut-liver oil, orange juice and various other vitamin types, but chiefly vitamin D, are necessary. The services of the dentist should be sought as soon as possible and arrangements should be made for the child to be taken regularly to him.

The Teething Child.—Much has been written and said about the teething era, and perhaps there is no occurrence which has to bear the same amount of blame for the causation of disease than has the period of eruption of the milk teeth. This matter requires to be very critically examined. In the first place, there appears to be very little constitutional disturbance when the permanent teeth are coming through; but without doubt in ordinary children, sick or well, there is some sort of reaction of teething, locally and generally, and this refers to 99 out of 100 children. The average mother has the explanation ready on her lips for any kind of disturbance in her baby: "It's his teeth, doctor." How right she may be is debatable. It is certainly true that teething means something very important to the infant. In the beginning it means that sucking days are ending and that munching and chewing are imminent. That there is local irritation and even pain in the jaw cannot be contested by anybody who has shared a house with a teething baby. But the question arises: how much is the reaction (see below) dependent upon local disturbance and general response and how much does it indicate with regard to the changes in basal metabolism, in digestion and in fact in the whole physiological re-orientation that has to come at the time of teething? Again, how much may the teething era be in concordance with, say, the phase of puberty or the period of the menopause? Nobody seems to have solved the problem, but it is always advisable to bear in mind that teething *per se* may be only a coincidence with the greater changes which are taking place in the rest of the body, and the more dramatic symptoms may in fact, conceal the fundamental changes going on elsewhere.

Whatever theories may be proved right, the plain facts are that teething gives rise to certain symptoms and signs which may be serious. First there is the irritation and pain, the restlessness, the flushing of the cheek, the crying, the sleeplessness, the loss of appetite and the bowel difficulties which every mother has to endure. In certain cases, however, it may be obvious that the child has a rise of temperature, confirmed by the thermometer. Attacks of diarrhoea with green stools may also be noted, but generally the diarrhoea amounts to greater fluidity with several stools of rather strong odour. Digestion is not impaired and the colour of the stools may be light brown. Loss of weight is not common and the thirst induces the child to take more fluid. It would seem

that the looseness of the bowels is entirely a matter of exacerbation of the intestinal action and quite in keeping with the basic activity of the body. Sometimes there is vomiting, especially when weaning has begun, but more commonly when the child is between the ages of 12 and 18 months. This has been explained as the result of tenderness of the gums and consequent indigestion resulting from non-mastication, but there is more than that to account for the vomiting: it might well be that the child is allergic to any new or additional foods and requires to be carefully desensitized, and here it may be remarked that mothers tend to overfeed the one-year-old rather than starve it. Another sign is cough—the so-called “teething cough”—which is well known and which is obviously pharyngolaryngeal in type. Increased salivation occurs at teething times and the saliva may tend to accumulate at the back of the mouth, giving rise to irritation and a cough, which is worst at night because the child does not consciously get rid of the accumulations of swallowing. The skin condition (generally referred to as *eczema* for want of a better name, but properly a *dermatitis* of brief duration) is another element in teething which suggests that the whole reaction may be one of allergy or acclimatization to more permanent nutritional machinery. The lesions come and go very quickly and do not ordinarily require to have any treatment. Lastly, so far as the so-called “teething fits” are concerned, surely these are not associated with the teething itself; they may be caused by abnormal feeding, which in any child at any early stage may cause convulsions; or they may be dependent upon congenital cerebral defects or upon avitaminosis such as is exemplified by rickets.

Management of the Teething Phase.—As a rule the average mother resorts to regular doses of “Milk of Magnesia” and sometimes to castor oil as a single dose. The provision of teething rings, hard biscuits and various other adjuncts to the encouragement of dental eruption is to be encouraged. The constant salivation in the younger infant demands constant changing of bibs, and as the skin over the chin tends to become rough and sore, application of a lanoline and boric acid cream is generally of very good effect. When there are any evidences of rickets, cod-liver oil or halibut-oil and malt should be given as well as other vitamins contained in orange juice, blackcurrant juice and rose hip syrup. As a matter of fact there are very few careful mothers who do not provide these vitamins as a routine, whether there is evidence of rickets or not. In some cases grey powder with sugar of milk have to be given in small doses at bedtime, to be followed next morning by “Milk of Magnesia”, and this despite the fact that the bowels may be somewhat loose. In very rare instances the child is so disturbed and restless at night that the doctor in charge may consider the need for the administration of suitable doses of chloral hydrate;

needless to say, this is resorted to only when the parents themselves begin to suffer from lack of sleep.

Sleep.—It has already been stated that sleep is of the greatest importance to the child. The various minor disturbances of sleep have been considered in Chapter 1, but now brief remarks must be made on the more serious causes of broken sleep. Pain anywhere is a cause of sleeplessness, the child waking up at intervals and giving a short cry, then lying restless and uncomfortable for some time. Abdominal pain must be investigated, the slightest irritation, e.g. of the napkin, causing sleeplessness. Incidentally, it should not be forgotten that the accident of putting the safety-pin of the napkin into the child's skin has happened more than once. All extraneous factors causing sleeplessness having been eliminated, there remains the investigation of disease. Indigestion may be dealt with first; it is true that a child goes to sleep well when it has had an evening feed, but that feed may give rise to sleeplessness—often night terrors—in 2 ways. First, the mother may have been tempted to give the child too much, especially at weaning time. Secondly, although she may not have exceeded the appropriate amount of feed, the hour at which the feed was given may have been too late. In both cases normal digestion is interfered with; there is no need to go into details of infantile digestion now, but suffice it to say that metabolism in the sleeping period is temporarily changed. All the gastric, duodenal and auxiliary glands of the digestive system are upset by wrong feeding.

In cases of disturbed sleep associated with difficulty in breathing apart from frank pulmonary disease, in which the child suddenly awakens up and after a momentary struggle for breath gives out a sharp cry more of the nature of a screaming fit, and then seems to relapse again into sleep, it is well to have the throat examined, for almost certainly adenoids will be found and the companion lesion, enlargement of the tonsils. As the child sinks into deep sleep the whole of the pharynx becomes relaxed; this, together with the shutting out of the passages by overgrowths, actually chokes the child, the asphyxiation ultimately forcing him to scream and thus to open the passage to the lungs.

Infants who are bottle fed especially may have attacks of colic. As mentioned in Section VIII, the latter need not occur if the mother makes sure that the feeds are interrupted by the procedure of patting the child's back until wind is brought up. Voracious feeding through a teat that is too wide, and certainly fatigue and hunger, together will generally result in wind colic as above; wind is not easy to dislodge in the colon, despite all the attributes of gripe water and similar remedies known to every mother—and father too. A very disturbed night, with restlessness, moaning, bursts of crying and drawing up of the legs may point to colic. Dill water is the classical sedative, but there are many other remedies.

Teething reactions, referred to above, are also the cause of broken sleep and very disturbed nights.

A fevered child will be drowsy or even delirious. Often the delirium amounts only to talkativeness; sometimes there is moaning; the general effect on the amount of sleep is not to disturb it so much as to alter the pattern. Restlessness and possibly whimpering, together with the effects produced by pyrexia and the perspiration which goes in its train, all combine to cause anxiety in the mother, who may sit up watching over the child and who thus observes that the sleep is far from normal.

So far as wakefulness is concerned, we have to keep in mind the effects of the disease, encephalitis lethargica, which is very insidious in its onset. One of the main points in the diagnosis, however, is that the child sleeps all day and does not want to sleep by night.

Lastly there is the psychological aspect of sleeplessness in a child. All the research of the past 30 years has shown that the developing mind has to deal with increasing complexes and that mental adjustment is more difficult for some than for others. Thus a child may go to bed, happy and apparently quite contented after a day at school and may ostensibly fall asleep quite normally. At varying periods after going off to sleep however, the child may waken up suddenly with what can only be termed a "brain storm," in which there is a demonstration of terror: screaming, tearful crying, actively hysterical movements of the limbs—indeed panic. Very often incoherent language is used or at least irrelevant language, showing that some unconscious repression has found its way to the outside because of relaxation during the first hour of sleep. It is constantly found that the child has little or no memory of what has happened and certainly no detailed impression of the nightmare. This state of affairs may go on for a long time, but as a rule the investigations of a psychologist will find some cause for the disturbance—domestic, scholastic, personal—and try to remove the complex so firmly established. Such cases demand much sympathy and understanding and it must be urged that punishment is not only useless but barbaric.

CHAPTER 3

MANAGEMENT OF THE CHILD IN HEALTH AND DISEASE

HEALTH AND THE CHILD. THE DAILY PROGRAMME. NOURISHMENT. EVACUATIONS. CLEANLINESS. CLOTHING. THE CHILD'S MIND. NURSING OF SICK CHILDREN. OBSERVATION OF THE SICK CHILD. RECORDS. OTHER POINTS IN EXAMINATION. ROUTINE NURSING PROCEDURES. SPECIAL NURSING PROCEDURES. DRUG ADMINISTRATION. MORPHINE. WELL-TOLERATED DRUGS. ILL-TOLERATED DRUGS. EFFECTS OF DRUGS. SOME METHODS OF ADMINISTRATION. TYPES OF DRUG IN USE.

Up to the present an attempt has been made to give the nurse a very broad view only of the child in health and disease, the idea being that she should appreciate the fundamentals before examining the superstructure. Many more details may now be added to the picture, especially those which are concerned with the nursing of sick children of all ages. Most of the nursing procedures peculiar to paediatrics are discussed in the following pages, but two reservations must be made. The first is that on account of the small space available only the everyday subjects can be satisfactorily dealt with; the second is that in various other Sections of this work many paediatric measures are referred to in dealing with adult illness and nursing. It may, therefore, be necessary for the nurse to use the Index occasionally when for some good reason a matter referring to the sick child is missing from the pages which follow.

Another very important point to be noted is that although it is obvious that no study of paediatrics can be complete without a very intimate knowledge of the feeding of infants and children, in health as well as in disease, this subject has been omitted from the present Section. The nurse will readily understand why this is so. In Sections III and VIII, all the information required may be found, and other references to feeding and giving of meals occur at various places in the 4 volumes which comprise this work. In this Chapter and in Chapter 4, when it may be considered desirable in the interests of the reader, certain facts may be stated although it is possible that they may have been mentioned earlier.

Before taking up the subject of the nursing of the sick child, it is advisable to make a short study of the normal healthy child of school age, and therefore in the next few pages a brief survey is made of the general background associated with this important phase.

Health and the Child

The first thing to be done is to coordinate all the factors already mentioned in the previous two chapters as intrinsic to health. The child as we see him now has completely emerged from the infantile stage and has become an individual, independent in action although strongly under the discipline and influence of his parents, especially the mother. Social medicine, which is dealt with in the next Section, tries to explain the complex actions and reactions of the organism in its environment and of the environment itself, i.e. the community. Children who enjoy proper freedom learn to think for themselves and to fend for themselves, but the ordinary child is dependent on his parents for shelter, food, warmth, clothing and moral guidance for at least the period of his school-days. The principles which govern the guardianship associated with this regime of social conduct are based firmly on hygienic science. The state of good health and the happiness resulting from it are what all earnest parents seek for their offspring, and this applies in a wider sense to all who are entrusted with the guardianship, permanent or temporary, of children. In the following paragraphs a summary is given of the main hygienic principles applicable to the growing school child.

The Daily Programme.—The average healthy child should have 3 good meals a day as a minimum. It may be that small snacks are provided—biscuits and milk, for example at 11 a.m. and at bedtime. Children at a day-school benefit very much from the provision of school meals, and in another direction their hygienic needs are supplied by the daily exercise walking to and from school. More than that, games at school and at home ensure that the muscles have plenty of work to do. The deplorable custom of doing school homework should not absorb all the child's time in the evening, thus children can participate in the domestic routine and make themselves useful. Regular hours of going to bed should be insisted upon, but an occasional relaxation of the rules is commendable.

Nourishment.—The normal child takes an ordinary meal, of the type already outlined in this work. Now every child is an individual and he or she has fads. In some cases dislike of certain articles of food is protective, since the child is allergic to them and reacts severely to their ingestion. There are children who without doubt are obstinate over refusal to eat certain things. The psycho-

logist could undoubtedly help in such cases but is not always available, and it has to be recorded that much domestic distress is caused by attempts to force a child to eat something it does not relish. There are different schools of thought so far as discipline is concerned, but it is the general experience that without coddling a child or without making undue fuss, tactful persuasion generally succeeds. Nevertheless certain dishes are anathema to the child (girls more than boys) and this should always be borne in mind in nursing the invalid, who may be much more sensitive to his food than is the adult. One very important point about school-children is that they should not be allowed to hurry over meals; as in all other things, pressure must be eliminated and relaxation should be the rule at all meal-times.

Evacuations.—The child as he grows up may lose some of the regular habits instilled into him in the nursery. Micturition is not a difficult problem for obvious reasons, but bowel action may lose some of its natural function under conditions of modern life. It is very important to ensure that children empty the rectum regularly. What has already been said in the Hygiene Section applies here with the additional remark that children, because they are not so well aware of the need for regular and prompt bowel evacuation, tend to dodge their duty. It must also be kept in mind that school-children approaching puberty have physical and mental worries of that particular era and the stress of education may blind them to their duties to Nature. Smaller children may fear the water-closet, or the latter may be too high; all these matters require to be investigated and put right. Incidentally not all doctors approve of the school of hygiene which insists that defaecation should be a matter of a drill to be attended some minutes after breakfast every day. Certain experiences may have proved to other medical men that the reflex of defaecation depends upon circumstances; what is required essentially are facilities in schools and elsewhere so that the child may go to the water-closet when the call comes; unfortunately such facilities are not always to be obtained. Looking at the matter of the excretions broadly, the mother should keep a check on the motions of her children and she should know how each child behaves with regard to regularity and other factors. Obstinate constipation (over 3 days) should be reported to the doctor. Many mothers have the wisdom to anticipate bowel troubles and give a dose of aperient or laxative medicine at intervals, but in no respect should this amount to a sidetracking of the natural forces: it should only be resorted to when conditions are such that ample residues are not left in the food or for other very good reasons. On no account should the habit of regular purging be adopted. Proper food, ample exercise, correction of lazy habits and sympathetic encouragement should overcome constipation in children in almost every case.

Cleanliness.—The time-worn picture of the small boy smothered in dirt is familiar to all, but the essence of hygienic cleanliness is to know what is dirty and dangerous and what is dirty and not dangerous; this is a big problem. Children in an ideal environment can be made to play in very suitable surroundings and can be trained to wash the hands especially before and after meals. But in the less salubrious areas, where the garbage bin represents the wicket and the ball has to be recovered from open drains or dirty gullies, grease and disease go hand in hand; add to this that there is not any hot bath or supply of clean clothes available after such adventures and the cause of diseases such as typhoid fever, dysentery and septic inflammation is clear. The average child should have pride in being clean and should not consider for instance that the daily bath or more frequent wash is an infliction and that teeth cleansing twice a day is a nuisance. Up to a certain point all such measures should be supervised. Persons in charge of children should be reminded also that both boys and girls should be instructed to wash the hands after visits to the lavatory and in some cases to cleanse the perineum; there need be no difficulty about this.

Clothing.—Every child differs with regard to its heat regulation. The easily chilled child should have thicker underwear in winter; the child who does not complain of cold should not be in any respect coddled. There is no need to repeat what has already been said in Section III about clothing; the present discussion refers only to the proper application and distribution of clothing at all seasons. All children, boys especially, like to feel the stimulation of cold weather and provided they are active and well fed the overcoat does not matter so much. Of far greater moment is the dryness of the clothing. It is dangerous for any person to sit about shivering with damp garments on; in all circumstances these should be removed as soon as possible. The greatest danger lies in the temperature of the feet; in rainy or other inclement weather the footgear should be absolutely waterproof; there are many ways of keeping the feet dry and to ensure this state common-sense methods are required. These suggest themselves at once; the only reminder to be given is that in bad weather the school child may have to sit all morning with damp feet which are below normal temperature, despite the warmth of the classroom atmosphere; some measures of prevention of the sequelae, e.g. pneumonia and other similar complaints, are required here.

The Child's Mind.—Lastly, when all the physical essentials of child health have been determined, there remains the greatest and the most important essential—that of the mind. Psychologically the child is an individual who seeks normally to free himself or herself from the parental ties and to behave as any other

natural animal does. The child's education helps but does not entirely succeed in explaining to him why he has to desert his instincts and restrain his urges and the result of this is that there is constant disapproval in his subconscious being, brought to consciousness only occasionally and as a protest. Such turmoil may disturb the mind of the child and he cannot explain why, nor for that matter can his parents as a rule. The most difficult period begins when sex maturity is at hand and when puberty demands explanation. The whole problem is made indescribably complex because of the repressions and the inhibitions associated with the ordinary home life. Unfortunately parents continue to encourage the idea that sex in all its aspects is bad; yet they themselves know better. There is no time to go into every detail of sex education and psychotherapy as applied to the child, but this much may be said: frank and full information should be available to both boys and girls; the so-called "awkward" questions should be treated in all seriousness and should be answered faithfully, the difficulties of puberty and other sexual matters, including perversions, should be anticipated and both father and mother should frankly explain the fundamentals, biological and mental, of sex activity and drive. All the points stressed above should be in the nurse's mind when she has to deal with the boy or girl approaching or at the stage of puberty.

Nursing of Sick Children

It is assumed that nurses studying paediatrics have a good general knowledge of nursing of adults as already described in this work. It is therefore unnecessary to do more than mention various procedures which have to be adopted in dealing with certain situations in children's illnesses. One of the most important attributes of the successful children's nurse is a knowledge of how to handle the patient—not only the infant and the toddler but also the girl or boy of 11 or 12, or indeed, the child at any age from birth to, say, the age of 14. And as might be expected from what has been stated above, the term, handling, means management of the mind as well as of the body and above all the carrying out of the treatment ordered for the particular patient under review. In Chapters 1 and 2, various signs and symptoms of health and of ill-health were mentioned, but so far as the latter is concerned, abnormalities rather than diseases were described. In this Chapter, each common symptom is described and discussed with special reference to the diseases associated with it. Furthermore, special kinds of treatment peculiarly applicable to children must necessarily be described. Lastly there are certain special procedures which belong to the realms of the fully qualified doctor and these have to be explained so that the nurse will

be able to appreciate what is being done and accordingly will be able to render the maximum assistance.

Observation of the Sick Child.—Watching a child closely as well as at a distance will provide much information of great usefulness; observation in a quiet and thorough way is, indeed, fundamental to the proper understanding of any case. This is easier with infants than with older children, who are very self-conscious as a rule and given to a certain degree of fearfulness; the personality of the nurse will, therefore, have a great influence in such cases.

Attitude.—How does the child lie in bed? Is it listless, quiet, flaccid, disinterested in its surroundings? Is it active, restless, irritable, fearful? Is it so active that it would get out of its cot or bed unless restrained? All these questions must be answered. Notes should be taken.

Crying.—A child may whine or moan in different degrees of loudness; this generally indicates collapse or delirium. It may cry lustily until it is tired; in this case psychology more than physiology may be the line of investigation. Bursts of crying may occur when there is spasmodic colic, this being accompanied by writhing movements and generally drawing up of the knees. Crying may also be due to home-sickness, general weariness and constant irritating pain such as tooth-ache. But the cry of alarm which is almost a scream is associated with acute pain, especially in active knee joint disease and acute appendicitis in which in both cases the slightest jolt of the bed may cause a paroxysm.

Facial Expression.—Pallor may mean general debility, chronic septic disease (including tuberculosis), anaemia, fright and various other conditions. Apart from skin disease or rashes, increased redness of the cheek, especially when it is one-sided, may indicate hectic fever and especially bronchopneumonia. Rhythmic movements of the alae nasi, as already stated, are a sign that breathing is difficult and should turn the nurse's thoughts also to some condition of lung inflammation. Cyanosis suggests the weak heart or some obstruction to breathing, especially diphtheria. The child generally frowns when the chest is the site of the lesion and grimaces when there is abdominal pain. It must not be forgotten that children who are sick also become easily hysterical and are apt to throw toys, feeding cups and other articles away from their bed; this does not apply only to the youngest children.

Records.—The next procedures are the taking of the temperature, counting of the pulse and estimation of the respiration. Of the 3, the last is probably most difficult as the child may not be collaborative and may not lie still.

Respiration.—Since the child's breathing is generally of the

abdominal type it may be most convenient to expose the upper part of the abdomen and count the rises and falls; now and then it may be possible to confirm the record obtained by placing the flat of the palm gently over the epigastrium. The infant may have a rate of 35 to 40 respirations, the child of 1 about 30, the child of 5, 25; boys and girls at the age of 15 normally breathe at the rate of 20 per minute. It is not the respiratory rate alone that is important, however, but the ratio of pulse to respiration. This should be normally $3\frac{1}{2}$ -4:1.

Pulse.—One way of taking the pulse is to have the mother present and to have her hold the child's hand in her own hand; the nurse may then gently find the radial pulse, put her fingers on it in the usual way and make the count. Nurses may be reminded that when a child starts to cry it is useless to attempt to take the pulse rate, which will probably have raced up 20 beats in the process. In some children the pulse may be seen—at the anterior fontanelle in infants, on the wall of the chest in the area of the apex beat and in the neck. A child of 1 may be expected to have a pulse of about 110, of 5, about 100, of 8, 90; at the age of 12 the common pulse rate is 80 per minute. Taking the pulse while the child is asleep will prove that there is a reduction of anything from 10 to 20 beats during sleep. Many authorities consider that the pulse rate in children is not of much use in clinical investigation. It is generally quite impossible to do any more than check the rate and rhythm, but even the latter is not of much moment, since the child's heart is often irregular. There is one very important record to check, however. When the pulse of a child is very slow and also irregular, this is a grave sign.

Temperature.—Here again a warning must be issued: the temperature of the child cannot be compared with that of an adult, for they are on entirely different bases. Children react much more sensitively to outside influences as well as to the alterations in the work of the heat-regulating centre of the body; in fact, sometimes the most trivial atmospheric conditions will raise the child's temperature. Although this may be so, it does not always mean that the child will have a serious illness, in fact it is one of the outstanding features of the child constitution that the small patient may have a temperature of, say, 101° F. in the evening and present all the features of the onset of a severe malady, yet by next morning the temperature will have fallen to below normal and the "sick" child will be apparently well, demanding all kinds of substantial food. In taking the temperature, for those over the age of 8 and who are of good intelligence, the thermometer may be put in the mouth under the tongue, the child being sternly warned not to speak, to cough or to move the thermometer. But for younger children, especially those whose discipline is not good, the thermometer may be put in the rectum and held there by the nurse;

it is never very satisfactory to take the temperature in the groin or axilla.

Other Points in Examination.—As a rule the mother or guardian is with the child when it is examined for the first time, and much of the mother's story is usually helpful; it is also very convenient to have somebody well known to the child to be with it when the examination is made, since any difficulties over shyness are removed and the child will generally permit full examination as it sits on its mother's knee. As every nurse knows, children become accommodated to hospital routine very soon and often turn out to be perfect patients.

The Tongue.—When there is difficulty in making the child put out its tongue, it will almost invariably be found that in very young children, pressure on the chin generally causes the child to protrude the tongue; if this should fail, the old-fashioned method of placing a little sugar on the lower lip may be successful. Occasionally it is necessary to pinch the nostrils, but it is better to have this done by the doctor or at least to ask for the assistance of another nurse.

The Skin.—This should be carefully examined for any evidences of vermin or parasites, for abrasions, ordinary infectious skin lesions and so on. If anything abnormal be discovered a note should be made and a report given to the doctor.

So far as the other items in the examination are concerned, most of these will be found in Chapters 1 and 2.

Routine Nursing Procedures.—In the brief paragraphs which follow, the main data are given regarding the routine nursing of children, especially those in hospital; as already stated procedures which apply equally to adults are not referred to unless special mention is desirable.

The Hair.—Care must be taken to ensure that the scalp is free from ringworm, alopecia, dandruff or impetigo; indeed, anything abnormal should be reported. In some cases the order is given to cut the hair and shave the child's scalp; this need not be a terrible ordeal for the child if the nurse tactfully makes a joke of it. Nowadays removal of the hair is not very often called for, first because epilation can be done by exposure to x-rays and secondly because modern therapy involves the use of drugs which act independently of the presence of hair. The subject is dealt with in Section VI.

The Eyes.—In the first place, when the patient wears glasses great care must be taken that the lenses are not broken and that the child wears the spectacles constantly during the day, as generally ordered. Any discharge from the eyes should at once be notified, for treatment should be started without delay and the eye specialist will require to be sent for urgently. Most eye inflammations of children are septic and thus contagious, therefore isolation may be necessary.

The nursing of the eye case in the children's ward is much the same as that in the adult ward. Except in special hospitals for eye diseases, it is customary to have a few beds reserved for children in an annexe of the adult ophthalmic ward, therefore all the necessary equipment is at hand. It is very difficult to keep children both quiet and amused after eye operations, since the stillness insisted upon by the surgeon should be absolute. Often it means constant watching at the bedside and restraining of arms.

The Nose.—Nasal complaints are not very common in children, except for those associated with adenoids or enlarged tonsils and sometimes sinusitis. It is very difficult to persuade even a fairly big child to douche the nose but syringing can be done or mopping of the nares with cotton wool pledgets soaked in a disinfectant.

The Mouth.—In thrush and allied conditions, in pharyngitis and in tonsillitis, the mouth may require to be sprayed or even painted with a disinfectant. Some children may be persuaded to gargle properly, but they generally make more of a mess than a success of the treatment ordered; they generally become panic-stricken and may choke and splutter. Tact and perseverance are once more required.

The Urine.—When a child is still in the napkin stage it is well nigh impossible to measure the amount of urine passed *per diem*, without resorting to special measures. However, since children are susceptible to albuminuria and other abnormalities and very often to urinary infection, every effort must be made to obtain a satisfactory specimen of urine. In females catheterization is a simple matter, the patient being put on her back with the buttocks on a sandbag; after cleansing the area with a weak mercuric perchloride solution, the operator passes usually a No. 3 glycerine-lubricated catheter, the urine being collected in a large test-tube. In the case of males, the prepuce and glans penis are disinfected as above, and the penis is put into a sterile test tube, the latter being moored to the abdomen by ordinary strapping.

The Stools.—In all cases careful watch should be kept over the bowels. The younger the patient the more attention should there be paid to the type of stool passed. The average healthy breast-fed or bottle-fed infant may have 2 to 3 stools daily, and it is a classical description which states that normally they should be like beaten-up and cooked eggs in colour and consistency. When the stools are green or very light or unduly dark, curdy, or like red currant jelly, or in any way offensive or watery, a report should be made. In older children a watch should be kept for threadworms. The amount of faeces passed depends upon the age, and allowances must always be made for the latter; as already stated, constipation must be noted and steps taken to check it. The examination of stools is conducted as in adult circumstances. Special

bedpans and urine containers are made for use in children's wards and are of suitable size and shape.

The Buttocks.—Children have to be protected against bedsores as adults are, but the skin of the child is more elastic and less easily affected by pressure than that of the older person; in certain conditions of great wasting and debility pressure-sores are naturally to be found unless strict precautions are taken to pad the vulnerable points as already described for adults.

In infants wearing napkins, the buttocks may easily become excoriated. This may follow an attack of diarrhoea or may be the result of faulty metabolism of some type, especially when there are offensive green stools, the latter the results of excess of starchy and fatty food. Sometimes the raw area appears to be acutely active and causes great alarm to the mother; with a dietetic adjustment however, it is surprising how quickly the skin mends. Nevertheless, while it lasts, the condition may cause great pain and disturbance to the child, who cries almost incessantly; the difficulties are increased because this state of affairs is rarely found in plump and healthy children, but occurs in those with lax skin over the buttocks. In the palliative treatment which is necessary until the metabolic adjustment is complete the nurse will find that dressings of gauze on which "Tannafax", "Monsol Cream", soft paraffin or other soothing ointment is applied will be satisfactory, but in some cases powdering of the buttocks and all the perineal area with a very well refined soft talcum and boric acid powder will suffice. Care must be taken in washing the area to avoid extremes of heat and to refrain from any rubbing with sponges or swabs. In certain circumstances it has been recommended that the napkins be specially treated in the boiling, washing and rinsing processes, especially when the urine becomes excessively ammoniacal, e.g. when a soaked napkin may have been left on too long. It is believed that this may be caused by soap left in the napkins or by a microbe which causes ammonia to be released from urica; accordingly, to prevent any dermatitis, after thorough rinsing in weak mercuric chloride or biniodide solution, the napkins (and indeed, any other clothing likely to be affected) are dried as they are. In some cases it is recommended that a soda-free soap should be used and then in rinsing a 2 per cent solution of boric acid should be left in contact with the clothing in order to neutralize any alkali and to render the napkin capable of neutralizing any ammonia which may form later when the napkin is in use. It need hardly be added that in normal cases when the napkins are changed, the perineum and buttocks should be sponged with soap and warm water, dried with a fine Turkish towel and then freely powdered with one of the excellent baby powders obtainable anywhere; most nurses also powder the warmed fresh napkin before applying it. The remark may be made here that when nap-

kins are changed regularly and when a special note is made of the time about which the napkin will be soiled so that a change can be speedily made, very little trouble is likely to be encountered with the skin of the buttock area.

The Sickroom.—A few words should be said about the value of sunlight and fresh air in the sickroom. As in all other cases, draughts should be avoided, but the open window should be



FIG. 159.—VERANDAH TYPE OF WARD.

(By courtesy of the Sutton Manufacturing Co., Ltd., London.)

encouraged as much as possible, especially when there is a good source of ultra-violet light in the sun by day. Modern hospitals are designed, as already described in the Hygiene Section, for the purpose of getting the most out of the natural air and light, and those with available verandahs demonstrate how much can be done for the sick child in this way. In private nursing, it is essential to make the most of the existing conditions, the policy being based on the hygienic principles to be found exemplified in modern hospitals referred to above.

Procedures Described Elsewhere.—The nurse is referred to other parts of this work for information in regard to the following: investigations and tests; enema administration; inhalation treatment; hot and cold applications; counter-irritation; baths; various other nursing procedures. The child's reactions to certain kinds of treatment may not be the same as those of the adult; great patience and much skill and tact are necessary in dealing with the sick child. Some of the procedures for adults already discussed in other places in this work may be simply modified to suit the child; in most cases it is a matter of common-sense adjustment to circumstances, in which the age of the child is generally the dominating factor.

Special Nursing Procedures.—In addition to the above there are one or two nursing procedures which require to have special attention in the case of the child; these are briefly outlined below.

Blood Samples.—Generally blood for examination is withdrawn from the veins of the antecubital fossa in children over the age of 5. In younger children however, and in certain conditions in older children, blood may have to be taken from the anterior fontanelle, the external or internal jugular vein, the femoral vein or a vein in the scalp. In all cases the position of the child is very important and as it is generally the duty of the nurse to hold the child and to keep it still, brief descriptions of the procedures are given below. In the case of the anterior fontanelle the scalp should be prepared by shaving over the fontanelle area and round about for $\frac{1}{2}$ inch. The child should be wrapped in a blanket, its arms inside and kept there; it should lie on the right side. So far as the external jugular is concerned, it crosses the sterno cleidomastoid muscle and can be seen, especially when the child cries. When the right side is chosen, the child is laid on its back, the head being turned towards the left shoulder. In dealing with the internal jugular vein, the operator will require the nurse to expose the base of the neck and to keep the arms bound; the child lies on its back; when the right internal jugular is chosen the head is turned to the left. When the femoral vein is used, the puncture is made just below the inguinal ligament; the patient should be laid with its buttocks on a sandbag. The nurse must stand at the head of the cot or table and fix the child's arms with her own arms while she uses her hands to hold the buttocks; sometimes another nurse is required to hold down the child's legs. In all the above procedures rehearsals are essential for success.

Gastric Lavage.—This is used for various purposes, diagnostically and therapeutically. It may also be employed as a pre-operative measure, e.g. in Rammstedt's operation. The tube used should be not of greater calibre than a 6 to 8 English catheter. The solution used is one of sodium bicarbonate or of warm water, the

latter for preference in view of the dangers of alkalosis. After the tube has been lubricated with glycerine it is passed in the usual way. Then the stomach contents can be removed and measured and the funnel fixed to the end of the catheter; after 2 to 3 ounces have been given, the syphon action is again started and again the funnel is attached and more fluid passed down. When about 20 ounces have been used in this way the stomach may be said to be clear.

Gavage.—Gavage or nasal tube feeding may also be given by the mouth. The nasal route is to be preferred. Gavage is used when a child is unable to suck either the maternal breast or from a bottle. The general routine is to feed 4-hourly, the milk or other fluid being strained through muslin. In cases of thrush neither gavage nor gastric lavage is permissible.

Drug Administration

The younger the child the more difficult it is to administer the drug; this dictum applies to most of the ordinary methods of administration and the place of introduction in the body. In deciding about the drug, the amount to be given and the channel of introduction, therefore, reference has to be made to the age of the child and to the body weight; there are 2 formulæ by which some assessment of the suitable amount to be given may be made, the first being that of Young, viz.:

Dose required = $\frac{\text{Age of child}}{\text{Age of child} + 12} \times \text{dose for adults}$, and the

second being that of Clark which states that the dose for the child concerned may be calculated by dividing the weight of the child in pounds by 150 and multiplying by the figure accepted as the adult dose. In dealing with children we must remember that they are growing organisms altering from hour to hour and day to day, and the response to drugs may not be of the same character and degree as in the case of adults. As a rule, 4 general principles are accepted, these being 1. that the medullary centres are very sensitive; 2. that the child's brain centres in the cortex are much more tolerant to sedative drugs than are those of the adult; 3. that the adjustment of bodily acids and bases is not stable; 4. that the fluids of the body are apt to be easily disturbed.

Morphine.—This drug should rarely if ever be given to children; it is well known as likely to depress the respiratory and other vital centres. All the pharmacological experts stress this point and recommend the giving of codeine instead, which allays cough, always a difficulty so far as children are concerned. Morphine is a dangerous drug strictly controlled by law (D.D.A.), but nevertheless, all nurses should themselves realize its dangers and

should be alive to the possibilities of drugs with perhaps proprietary names but which contain morphine.

Well-Tolerated Drugs.—As mentioned above the cerebral cortex is not easily influenced in children, therefore sedatives can be safely given, and chloral is well known as being safe; the same can be said of the barbiturates including phenobarbitone ("Luminal"). Belladonna and its allies are also well tolerated.

Ill-Tolerated Drugs.—With special reference to principle 3 mentioned above, great care must be taken with drugs which may set up conditions of acidosis or alkalosis. Kidney disease in the child requires to be specially watched. Even the giving of minute amounts of alkali may cause tetany, and acid-producing drugs like ammonium chloride have to be very carefully avoided. Dehydration after a spate of diarrhoea may be made actually dangerous by giving a drug which will increase the dehydration and lead to acidosis. The latter is more easily produced than in the adult and nurses may be reminded that in the old-fashioned treatment for worms in which 2 or 3 days' starvation was followed by the giving of, say, male fern and finally a saline purge such as magnesium sulphate (Epsom salts), acidosis was the great risk. So far as anaesthetics are concerned, it is considered to be most convenient to deal with them in the next chapter. But with regard further to acidosis it should be stressed that that great standby of the physician—sodium salicylate—always given to adults with sodium bicarbonate and used largely in rheumatic conditions, requires in the case of the child about twice the amount of sodium bicarbonate when over 60 grains are being administered daily. For the reasons given above, wintergreen ointment (methyl salicylate) should not be used for children, since there is no neutralizing alkali; similarly aspirin alone should never be used in any big quantity although it is safe in small doses; when large doses are prescribed it is customary to add an alkali.

Effects of Drugs.—Drugs may affect the skin and the urine and thus give rise to some panic in the household. Children may tolerate barbiturates and sulphonamides well but the skin rashes occasionally set up are alarming. The urine may be green or red after santonin is given (in treatment for worms). Sometimes after chloral administration there is reduction of Fehling's solution so that presence of sugar may be suggested.

It will be clear to nurses that certain precautions are necessary in the therapy of paediatrics. The late Noah Morris very wisely emphasized however, that in the case of children, ample food of the right kind and what he termed "mothering" were of much greater effect than any drug; he would not countenance the prescribing of a drug unless there was a clear reason for it. Making the

child comfortable and warm, happy and contented are of much more importance than pouring the mixture down the throat. There is no gainsaying the wisdom of this great therapist.

Some Methods of Administration.—In Section VIII, ample information is given about the varieties and properties of drugs, and almost all of it applies to children as well as to adults. But exceptions must of necessity be made. For instance a child of very tender years cannot be given a pill, and powders are very restricted; the latter require to be skilfully handled; they are generally given in a teaspoon, mixed with a little milk.

The methods of administration are given below.

Mixtures.—Many drugs will be administered in the form of mixtures, emulsions and other types of fluid. The nurse should not make any remarks about the nastiness of the medicine nor should she in any way prepare the child to resist it; there is a strong psychological influence here and experience brings many surprises in that many a child taking a so-called “nasty” mixture actually likes it and makes no fuss. If a sweet is to be given there should be no ceremony about it and certainly it should not be used as a bargaining factor. In the case of the younger child (infancy up to 3 years of age) it is most convenient to wrap the patient in a shawl so that the arms are not free; the nurse should sit down with the child in the semi-erect position and should open the mouth with the fingers of her left hand; then the spoon containing the medicine should be passed quickly as far back in the mouth as possible; the child will instinctively swallow.

Rectal Administration.—Often a suppository may be very effective. As a rule the administration of an enema is carried out in the way described in Section VII, but in children $\frac{1}{2}$ to 2 oz. of fluid (water, saline, 6 per cent dextrose) may be sufficient; everything depends upon the child's weight. Children under 5 generally react by straining when the catheter is inserted.

Parenteral Administration.—Various routes may be used—intravenous, bone marrow, subcutaneous, intramuscular, intraperitoneal. In most cases the doctor will personally supervise these administrations, but a few notes on each may be given.

Intravenous. This is used in all cases of dehydration in which fluids for various reasons cannot be given by the mouth. It is used after burns, great shock, severe diarrhoea. Sulphonamides and penicillin may be given in this way. The intravenous route may be used to introduce glucose, saline, lactate solutions, serum, plasma, blood or suitable combinations of these. The most satisfactory procedure is to expose the vein, e.g. the median vein on the front of the arm, the cephalic vein at the wrist or the long saphenous vein at the ankle. Splinting of the limb concerned is essential, the splints being fixed so that movement for the carrying out of nursing measures (the normal routine) is not prevented,

both child and splint thus being made into one unit. As a rule strapping is used. A cannula is put in, the solution being allowed to flow at the rate of about 20 drops per minute (up to 2 oz. per hour). In many cases a nurse is detailed to look after the drip mechanism and to make sure that all is in order, therefore nurses should make themselves familiar with the apparatus; the doctor generally visits at intervals and reports should be given to him when there is any doubt in the nurse's mind that all is not well. The "snags" to look out for are venous spasm, kinking of the vein, bandage or binding too tight, excessive rate of drip, leakage, invasion of pyogenic organisms. A great improvement in technique has been effected by the use of the modern transparent tubing and special cannula.

Intravenous injection may also be made by the temporal vein and by the veins on the back of the wrist; various fluids including drip transfusions can be given by these routes.

Bone marrow. This is a newer method resorted to in cases in which main veins have already been used, or in premature or shocked infants or in children with haemophilia; the tibia is the bone generally used.

Subcutaneous. The most suitable areas are the outer sides of the thighs, the front of the shoulder and the lower part of the chest behind. Normal saline only should be given by this route; both drip and complete injection can be given. After direct injection has been given, the area should be massaged for about 15 minutes.

Intramuscular. Here saline is again indicated, and the absorption is more rapid than with the subcutaneous route. Both thighs may be used at one time, and up to 20 oz. in 24 hours may be absorbed in this way. It may be convenient to mention here that injection intramuscularly, often left to the nurse, may be best done in children on the outer side of the thigh, since large nerves or vital blood vessels are not likely to be encountered. Other regions, all to be used with care, are the flanks, the gluteal region and the deltoid area.

Intraperitoneal. This is a modern method, probably more used in America than in Great Britain. It is useful for conditions in which big amounts of saline or of sodium lactate are required; this type of injection should always be given by a doctor.

Local Applications.—The paraffin base ointments are always of value, but in most cases the use of a fine dusting powder may be quite satisfactory. Such applications are merely protective; the old-established use of inunction is passing. Blisters and other sources of irritation are best avoided; poulticing should be resorted to only when it is certain that the child's skin is not too sensitive and that the materials employed are not irritative.

Types of Drug in Use.—Since ample information is given

about drugs in general in Section VIII, the selection made below is strictly limited and refers essentially to children.

Antipyretics.—It is not to be recommended that antipyretic drugs be given just because the temperature has risen, as it often so mysteriously does in young children; tepid sponging may be adequate. Aspirin is the safest, a child of 12 months being given about $2\frac{1}{2}$ grains, the need for alkali being kept in mind.

Antispasmodics.—Children are not upset easily by belladonna or its active principles. The drug, "Eumydrine", which is an atropine salt, is often of value in cases of congenital stenosis of the pylorus.

Aperients.—This subject has been discussed already in part. Here it must be considered mainly from the therapeutic point of view in diseased conditions. First of all it must be emphasised that drastic medicines are to be forbidden. That old veteran of many generations, the grey powder, is now consigned almost to the realms of the obsolete, as indeed, are all similar mercurial preparations. And no regrets will be expressed that the bane of nursery days—castor oil—is now recommended for use only when it is necessary to clear out the intestines quickly, e.g. in food poisoning. Liquid paraffin must always be given at intervals and with care. Senna is too griping for children, but suitable doses of cascara have excellent effect. Children also like and are benefited by compound liquorice powder.

Emetics.—As is well known, children very often swallow poisons contained in various vehicles—belladonna berries (deadly nightshade) for instance. Only 2 drugs should be used as emetics: 1. salt and water (see Section II); 2. apomorphine, which acts through a nerve centre. In very young children and infants gastric lavage (see p. 320) should be quite satisfactory. Gastric lavage should also be resorted to in comatose conditions.

Drugs for Diarrhoea.—A number of the old drugs, used for many years, have been proved, in the light of modern science, useless for the relief of the fundamental condition, which in most cases is caused by an irritant; the irritant may be bacterial in origin and it need not be situated in the lumen of the gut. Probably the best remedy in a general sense is magnesium sulphate (Epsom salts) which has several important actions; castor oil is similarly efficacious. There is little or no residual action and the diarrhoea stops. This method of "setting a thief to catch a thief" is by no means new; it is an old wives' cure with a long history and now science has caught up with it. As a result of research carried out particularly in the period 1940-45, the sulphonamides have been shown to be very useful when there is enteritis or colitis. The 2 most successful sulphonamides in this respect are sulphaguanidine and succinylsulphathiazole; modern pharmacology shows that any other drug apart from these is useless.

Respiratory Stimulants.—Children may require these more than

do adults; it has already been noted that carbon dioxide is used to counteract the effects of asphyxia neonatorum, because it stimulates the respiratory centre in the brain to greater action and thus brings about lung movements. Other drugs used are lobeline, nikethamide, leptazol, the two last-named being employed in poisoning by barbiturates or anaesthetics. Benzedrine is effective in narcolepsy.

Sedatives.—The sedatives form a big group and the right one must be chosen for the specific case; this is the doctor's province. It is the duty of the nurse to see that the sedative has the best chance to do its work, for such drugs are very important in the case of children. The average child is restless in health but in sickness he is unduly restless, even to the point of being irritable. The value of aspirin has already been stated, especially when the child is in a restless, fevered state. In hyperexcitability, the condition can generally be controlled by giving chloral, which all children tolerate, or one of the many barbiturates. Alcohol, sulphonal, paraldehyde (except when given per rectum), bromides, are all contra-indicated in a child. Phenobarbitone—the broadcast drug—is the most successful sedative for children and especially those with epileptic tendencies. The newer epilepsy drug, sodium diphenyl hydantoinate, must be used with discretion in children. Codeine in the form of the syrup is liked by children and is also effective when there is bronchitis, with intractable cough.

Sulphonamides and Penicillin.—The nurse is referred to Section VIII, in which both of these drugs are described very fully. In the case of children, the methods of administration are the same as those for the adult, and in particular instances some modification may be made to suit the case.

CHAPTER 4

MEDICINE AND SURGERY OF INFANCY AND CHILDHOOD

MEDICAL DISEASES OF CHILDREN. VITAMIN DEFICIENCY DISEASES AND ALLIED CONDITIONS. DIGESTIVE SYSTEM. CIRCULATORY SYSTEM. BLOOD DISEASES. GENITO-URINARY DISEASES. NERVOUS SYSTEM. NOTES. ANAESTHESIA AND THE CHILD. PREPARATION. PREMEDICATION. ADMINISTRATION. SPINAL ANAESTHESIA. DANGERS. COMMON SURGICAL AFFECTIONS. GENERAL PRINCIPLES. AFFECTIONS OF THE ALIMENTARY SYSTEM. DISEASES OF BONES AND JOINTS. TUBERCULOUS ADENITIS. SYPHILIS AND THE CHILD. RH-FACTOR AND THE INFANT.

THE diseases which affect adults may also affect children, but for several reasons there are diseases which are peculiar to the growing human being. No great effort of imagination is required to envisage why this should be so; in the first place the child is a growing organism with a metabolism in an unstable state and with activities going on that are not present in the adult; secondly there are certain diseases which are not to be found in the adult but which distinctly belong to the sphere of paediatrics not only because they attack organs (e.g. the thymus gland) which are absent in the adult, but also because the juvenile phase of certain diseases is quite different from the adult phase.

In this Chapter great care has been taken to discuss subjects of most interest to nurses and of greatest importance from the nursing point of view. As far as possible cross references are given to paediatric subjects dealt with elsewhere, and an attempt has been made to include the major diseases generally and peculiarly associated with children. This has made it necessary in some instances to return to a subject which is mentioned perhaps in Section IX or Section X or elsewhere in this work, but such inclusion is inevitable, in most cases because of its outstanding importance.

Our task is to survey in a few pages the common ailments and diseases of infancy and childhood, dealing especially with the treatment and nursing care; to refer briefly to 'anaesthesia as applied to children; and finally to review the common surgical

affections of the child and discuss how they are dealt with by surgeon and nurse.

Medical Diseases of Children

Medicine, which at one time was almost divorced from surgery, is now becoming bound more closely than ever to it and it is often difficult to say where surgery begins and where medicine ends. But without doubt certain phases of any disease process are strictly medical and certain are clearly surgical, so that the time has not come for a complete blending of the two. Accordingly, it is still customary to think of disease in terms of distinct medical categories and of distinct surgical categories.

So far as the diseases of the newly born child are concerned, as most of these are referred to either in Section XII or in earlier parts of this Section, there is no need to say any more about them.

Vitamin Deficiency Diseases and Allied Conditions.—

In the first place the nurse is advised to review all that has been stated in Sections III, VIII, IX and X with regard to vitamins.

Marasmus.—Formerly this disease was much commoner than it is now, the drop in incidence being due undoubtedly to better understanding by the mother of infant nutrition and vitamin supply. However, marasmus still appears in the ward and at the out-patient department, and the picture is a typical one. The child is very small and light for its age; the skin is wrinkled and the face wizened like that of an old man or woman; there is a faint feeble cry and listlessness in all movements; in fact the child appears to be weary and disinterested in its experience of life and would be glad to pass on. There may be vomiting and diarrhoea. In dealing with this type of case and when it is certain that the infant is not being starved for want of food or that any organic disease is the basis of the wasting, the first thing to be done is to make sure that the food is suitable; this may mean putting the child on the bottle. When this has to be done, more than enough should be offered at each feed so that when the child is satisfied there is still some more feed left. With the feeds carefully supervised and all the points already mentioned attended to, the nurse may see the reward of her labours in increase of weight at the end of a week—much indeed depends upon the nurse. Finally ample amounts of fresh fruit juice, cod-liver oil and halibut oil should be given.

Rickets.—This subject has been referred to many times already. The essential points to keep in mind are as follows. Rickets undoubtedly begins in the first weeks of life and is believed to progress without any external manifestation until the child is 6 months old; then the first signs appear and the mother may report restlessness, sweating of the head, absence of any evidence

of teething and so on. Signs continue to manifest themselves up to the age of 2.

In an established case, the following may be looked for: large head, dentition unsatisfactory, bending of long bones (especially tibiae), knock-knee or bow-legs, anterior fontanelle patent even at the end of the 2nd year, Harrison's sulcus, "rickety rosary," deformity of spine, general pallor, flabby musculature, protuberant abdomen (typical pot-belly). These signs occur when phosphorus is deficient, but when calcium is deficient the nervous system becomes irritable with the following additional signs of tetany: Chvostek's sign (spasm of facial muscles already described), Trousseau's sign (carpopedal spasm) in which the thumb and fingers are made into a cone, laryngeal spasm (generally known as child crowing), convulsions which often follow one after the other. Since the causes of rickets are lack of calcium and of phosphorus in the blood, as well as resultant lack of calcium in the bones, poor supply of vitamin D and of sunshine, coupled with deficiency of calcium and phosphorus in the food, are generally at the root of the trouble. In the treatment therefore, sunshine and fresh air, ample animal protein and fat, a reasonable calcium intake and administration of subsidiary vitamin D in the form of natural cod-liver oil and halibut-liver oil with or without orange juice or malt are indicated. Many proprietary preparations of vitamin D are available when for some reason the child refuses to take the oily preparations themselves. Late rickets is to be found in those who are resistant to vitamins, in coeliac disease and in kidney disease.

Infantile Scurvy.—This is also known as Barlow's disease. It has already been referred to earlier in this work. It is caused by deficiency of vitamin C. It generally affects infants in the 1st year, particularly those fed on certain kinds of baby foods. Scurvy may occur in children who for some reason are not given vitamin C in the form of fruit juice or who deliberately refuse to take it and are not persevered with.

The symptoms noticed by the mother or guardian are that the child resents being in any way disturbed; it lies apparently contented so long as it is not spoken to or lifted. Obviously there is pain in the limbs; pallor and low weight record are typical; dark blue (purpuric) patches occur on the eyelids. Swellings noted on the knees, thighs and front of legs are due to haemorrhage occurring underneath the periosteal covering of the bones. There is blood in the urine. The gums may be swollen. The ribs show a type of beading different from that of rickets, the tips of the ribs standing out prominently. In the treatment, which generally results in complete cure (except when there are complications) vitamins and, of course, vitamin C must be given—orange juice, tomato juice, rose hip syrup, black currant puree. Creamed

potato, made with milk, is also effective. Many synthetic preparations of vitamin C (ascorbic acid) are on the market. It is well known that as a result of enlightenment, mothers now anticipate scurvy and ensure its prevention by giving their children every day 2 to 4 teaspoonfuls according to age of one of the fruit juice preparations referred to above.

Coeliac Disease.—Although coeliac disease is actually a rare condition, it increased in incidence very greatly during World War II and took up quite a big space in British and American literature. It is a deficiency disease in which the child cannot assimilate fatty or starchy foods. The result is delay in mental and physical development. Females are affected more than males. As a rule coeliac disease begins at some point between the ages of 6 months and 2 years. The story generally told by the mother is that the child has not been progressing well in every respect and has refused food. The child itself is likely to compel the nurse's interest at once, for its weight is obviously very light (20 lbs. at the age of 3) and the body is small and wrinkled, the head being obviously too big for the body. The one outstanding feature is the abdomen. The hips are very flat. In the nursing of the case, the nurse will soon discover that the stools are abnormal; they are large in amount, very strong in odour, and so pale that they are said to resemble putty. Observed over a period of a week or 10 days, the patient will be found to alternate between constipation and diarrhoea; the stools will be found to contain a great excess of fat—over 50 per cent—whereas the normal stool has less than 30 per cent. Many biochemical tests can be made and the essence of the findings is that there is chiefly defect of carbohydrate absorption, of vitamin A absorption, of blood calcium and of blood phosphorus; the stomach juices are weak in hydrochloric acid. The bones are porous and often rickety; the blood is not normal. The modern idea about coeliac disease is that it is caused by a deficiency of one of the vitamin B derivatives in the liver. The outlook in very young children is not good, the fatal outcome being as much as 20 per cent. After recovery, however, the child may make very good progress, and although somewhat restricted in height, may be well covered. There is rarely mental impairment.

With regard to the treatment of coeliac disease, as might be expected dieting is the first consideration and diet sheets should be made out and faithfully followed. All fats should be reduced to the minimum and carbohydrate foods cut down, but plenty of nitrogenous (meaty) foods are permissible (see also Section VIII). At one period up to a dozen bananas a day may be given. Generally the diets are carefully worked out in 4 stages, however, and are of progressive type. Injections of liver are called for in serious cases; many of these are proprietary and their use is determined

by the physician in charge. Vitamin B complex is often used, intramuscularly or orally. Ample rest and plenty of sunshine should be the rule.

Digestive System.—As might be expected, the digestive system is of the greatest importance to development and growth. Any disturbance in the alimentary tract or its associated organs is likely to give rise to reduced supply of essential building stones of the body.

Congenital Pyloric Stenosis.—Of all the diseases affecting children, this is surely one of the most interesting and in many ways the term, dramatic, might be applied to it. The whole trouble centres on the pylorus, which apparently from birth is thickened, tough and resistant so that instead of acting as a valve it behaves more like a stop. The nurse may thus be able to see why the symptoms and signs are so typical of this condition. The general history (in about 6 cases to 1) is that a male infant begins at about the 10th day to vomit up his feeds. This vomiting is well described as "projectile" vomiting, for it is sudden and sharp and the vomitus is often thrown about 2 feet. The amount brought up in this way is great and contains, in addition to curdled milk, mucous secretion and blood-stained fluid. The vomiting seems to vary, and the mother will be jubilant because the child may be free from a bout for a whole day, but the next day is generally a reactionary one and several attacks may occur, the first one clearly consisting of more than one feed. All the time the child is lively enough although he is losing weight; he is unfortunately hungry: he bites his fingers, is restless and obviously "seeks" for milk. Constipation is obstinate. The parents in their efforts to stop the vomiting generally conclude that the food, natural or artificial, is wrong, and they resort to proprietary food, with unchanged effect. Ultimately when the doctor is called in he usually has little or no difficulty in making his diagnosis, which is amply confirmed by the presence of the swelling in the stomach region. As a spasm occurs, a wave, said by some to be like a golf ball, others like a tomato, rolls across the abdomen from left to right; this is typical. There are 2 methods of treatment, medical and surgical, and until the decision is arrived at which to adopt, the stomach can be washed out regularly and salines given per rectum or intravenously or subcutaneously. The surgical treatment is deferred to later on; the medical treatment is variably successful. Donald Paterson believes in gastric lavage carried out once or twice a day, the diet being very carefully studied and given. In order to allow the easiest passage of the food through the very narrow pylorus, milk giving the smallest curd is chosen—breast milk or peptonized milk. Ten minutes before each feed is due, an atropine preparation (Paterson recommends lamellae of "Pylostropin", each dose of which contains $\frac{1}{750}$ grain of "Eumy-

drin"), which is easily taken by the mouth is given. Any signs of erythema or of hyperpyrexia should be regarded as toxic reactions. This type of treatment should be continued for several weeks. But despite modern therapy the results are not good so far as Great Britain is concerned and in the end resort to surgery has usually to be made.

Stomatitis.—The commonest type is known as thrush. It is an infection of the lining membrane of the mouth caused by a vegetable fungus (*Oidium albicans*). The inside of the mouth, tongue and roof of the mouth show furry patches, which cannot easily be removed. Sometimes there is concurrent vomiting and diarrhoea. In very severe cases the infection may spread to the oesophagus or larynx. The old-fashioned remedy, glycerin and borax, is still in use, as well as a mixture of potassium chlorate, glycerin and water; these are applied with a brush or with fine gauze. The latter may also be used to remove the affected patches. In some cases, preferably hospital ones, 1 per cent gentian violet solution in water applied twice a day for 3 days then once daily for a fortnight will succeed in removing the patches completely.

Constipation.—This subject has already been investigated in many places in this work and only a few additional points need be mentioned. The first concerns constipation in the infant who is breast fed. The causes of constipation are generally 1. flabbiness of the abdominal muscles as a result of over-feeding and want of exercise; 2. lack of ample fluids; 3. bad training with regard to defaecation into the chamber-pot; 4. presence of anal fissure; 5. anus too small (stenosis); 6. starvation. There is a remedy for all of these, medical or surgical: 1, 2 and 3 can be rectified; in 4, witch hazel ointment spread over the anus and inside is a great help; "Milk of Magnesia" should be given also; 5 can be rectified by inserting the finger, lubricated with soft paraffin, once or twice a day. Turning to the bottle-fed baby, it is true that cow's milk is more likely to cause constipation than mother's milk, because of the stronger nitrogenous element present. Cow's milk, however, is never given by itself and is always altered (see Section VIII) to make it more nearly resemble mother's milk. In all the patent foods for babies there is a carefully adjusted ratio of protein to sugar and fat, and as the last two tend to cause looseness of the bowel, the constipating effect of the protein is neutralized. Before any drugs are resorted to the food must always be investigated and if necessary altered. The modern mother does not even keep castor oil in the house; olive oil may be occasionally used, but "Milk of Magnesia" is her standby, a teaspoonful in the morning being ample. And although some authorities condemn grey powder, it is very useful given in a teaspoonful of milk at bedtime, the dose being $\frac{1}{2}$ to 1 grain for a child of 3 to 6 months; sometimes sugar of milk is added to the powder. "Milk of Magnesia" should be given

early next morning. Constipation in the school-child has already been discussed.

Diarrhoea.—Diarrhoea in the child may be due to several causes and 3 types are recognized—infective, dietetic and symptomatic. In the summer in Great Britain various organisms may be active and give rise to severe gastro-enteritis, often referred to as summer diarrhoea. Dietetic diarrhoea does not occur without long warning being given; generally speaking a day's starvation, a teaspoonful of castor oil and readjustment of the diet is all that is necessary. Diarrhoea which is a sign of other (primary) disease is treated as a part of the general condition. It is with infective diarrhoea that the nurse will be most closely concerned. This is the true epidemic gastro-enteritis that breaks out suddenly when the heat of summer is intense. While it lasts this type of diarrhoea is very alarming, vomiting and frequent watery stools quickly causing severe dehydration so that the child becomes almost like a skeleton in a few days. In the treatment the first thing to be done is to start counteraction of the dehydration. In very severe cases intravenous drip (Hartmann's solution, half strength, with 5 per cent glucose) for 24 hours will be beneficial, sips of water being given by the mouth. This form of treatment requires practical experience. There are many schemes of treatment. In one, feeding is suspended until the condition of dehydration is entirely overcome and all diarrhoea and vomiting have stopped. The first feeds afterwards must be easily digestible—diluted breast milk, diluted and peptonized cow's milk, lactic acid milk or a dried milk of low fat content. So far as drugs are concerned, sulphaguanidine is easily the most satisfactory. Castor oil and grey powder are too drastic in a dehydrated child. In some cases the giving of grated apples is found to be very good in summer diarrhoea, weak tea being also given.

Ketosis.—This is also referred to as acidosis or cyclical vomiting. It is a condition of defective metabolism in which acetone bodies are to be found in the urine, blood and breath. It should always be borne in mind that this is a sign associated with various abnormalities such as infections, improper feeding, fatigue of muscle or nerve, hereditary tendency and various other conditions. The extreme state of cyclical vomiting generally occurs in small boys of poor muscular tone; these boys are by no means dull in the intellect. Girls may also show similar signs. Sudden pallor and fainting attacks are common, but the main evidence of ketosis is occurrence of vomiting after any mental strain, excitement or other effort. The vomiting is intractable and nothing will stay down; sighing respiration and air-hunger are typical. There is no actual collapse, but the prostration may be great. The treatment is carried out with the child in bed. After a thorough examination to eliminate primary disease, or to identify it, in the

case of the latter specific treatment may be decided upon, but so far as the acidosis is concerned rectal saline with 5 per cent glucose should be administered. Sometimes when there has been great dehydration, Hartmann's solution or saline and glucose may have to be given intravenously by the drip method. Glucose and fruit juice are good for the child when the initial part of the treatment is over. Barley sugar should be provided. Sodium bicarbonate should be used only in prophylaxis. Otherwise a diet containing the usual ingredients should be taken, and half a pint of milk should be given in the morning and half a pint at night. The child should never be overtired mentally or physically; sometimes it may be advisable to let him up only for mid-day dinner. Needless to say constipation must be avoided.

Circulatory System.—Most of the circulatory and respiratory system diseases in which the nurse is likely to be interested are discussed in Section IX. Some remarks must be made, however, with regard to the following diseases, all of which are congenital in origin.

Patent Ductus Arteriosus.—This is commonest in females and represents a shunt of the blood from the aorta to the pulmonary artery. The dangers are those of onset of infective endocarditis. In recent years the operation of ligation of the ductus arteriosus has been attempted quite often and with encouraging results.

Management of Congenital Heart Disease.—Congenital heart disease handicaps the child from the start and often even after a valiant struggle death occurs before puberty. Shortness of breath and in some cases blueness of the face or alternatively extreme pallor are the main signs. In the case of infants the posture must be adjusted so that the head is extended on the pillow. Loss of weight occurs because of lack of suckling power. The aim should be to make the food as concentrated as is compatible with maintenance of health.

Blood Diseases.—Only those diseases which are peculiar to childhood are referred to below.

Nutritional Anaemia.—This is also known as milk anaemia; there is generally a shortage of iron and copper in the food. The signs are pallor and plumpness. Such children are susceptible to infections. Dietetic reform is based on eggs, cereals, spinach and broth. Some infant foods contain added iron. The latter is often given by the mouth in palatable forms. Rest in bed in the sun is to be recommended. The anaemias of coeliac disease and of scurvy have been mentioned already.

Other Anaemias of Childhood.—There are many different types of anaemia in children and mention can be made only of a few of the commonest. Erythroblastosis (also known as icterus gravis neonatorum) is an anaemia of the newly born, and has already been

referred to; it is associated with the complex Rh factor in the maternal blood. Splenic anaemia of infants is characterized by splenic enlargement and purpura; generally the child is rachitic. The increase in size of the abdomen is caused by the hypertrophied liver and spleen. Recovery may be hoped for. In acholuric family jaundice, several members may be affected; the cause is unknown. This disease occurs in spasms or crises, 3 to 4 times a year. Slight jaundice and anaemia are noticeable. Rise of temperature and accompanying discomfort as well as vomiting may be found. The course is from 3 to 4 weeks. Children grow out of this as a rule; if not, splenectomy is indicated.

Hodgkin's Disease.—This disease, already dealt with in Section IX, is rarely seen in children below the age of 10. The swelling of the glands may completely obliterate the lines of the neck. So far all treatment has failed to prevent the fatal end.

Glandular Fever.—In this disease which is an acute infection often epidemic, it is believed that a virus is the causative agent. Age, 6 to 15 years. As a rule the temperature goes up to 103° F. or more. There is sickness, swelling of tonsils (which are covered with a pale white membrane), conjunctivitis and most prominent of all, enlargement of glands. In some cases there is a rash. Treatment is that of the symptoms shown. Recovery is uneventful but the patient should be given cod-liver oil and iron alternately, a week at a time.

Genito-Urinary Diseases.—The few subjects discussed below are additional to those to be found in Sections IX and X.

Physiological Albuminuria.—This is associated with puberty as a rule, or the years leading up to it. It commonly affects children between 10 and 15. The albumin appears after rising and increases as the day goes on. By night the amount is considerable. The albuminuria stops when the patient goes to bed. Staying in bed prevents the occurrence of albuminuria. The patient is generally of poor physique and very pale. Improvement occurs under tonic treatment.

Enuresis.—No more harassing complaint, so far as parents are concerned, could be imagined. True enuresis (i.e. as distinct from the enuresis which occurs in organic disease and is temporary) is undoubtedly functional. No greater problem is set the doctor or nurse when the bedwetter is the patient. Family history generally shows that as a rule the male parent has at one time had enuresis himself. Females are very seldom affected. The child is usually the likeable type—highly strung, sensitive, clever. In some cases the general health is not good, and bad teeth, overgrown tonsils and adenoids are contributory factors. Frequency of micturition during the day is a proof of the lack of grip in the sphincter muscles. There are various methods of treatment but the great healer is time; very few functional cases are to be found

after the age of 8. It must be agreed that much of the bedwetter's complexes are kept active by mothers who themselves are worried to distraction; the result is an increase of anxiety in the child. The psychologist should always treat both mother and child and sometimes good results are obtained. Drugs such as ephedrine and belladonna may be tried but most doctors will agree that they are not of much use. Efforts should, however, be made to reduce the number of acts of micturition per diem, to influence the child not to worry, to avoid all fussiness and comment on the wet bed, to eliminate any septic focus and to fortify the constitution by tonics.

Nervous System.—The conditions mentioned on the following pages are in the main dealt with as supplementary to what has already been noted.

Cerebral Diplegia.—This is caused 1. by defective development of the brain or 2. by injury to the brain during birth. Synonym: Little's disease. The main signs are discernible from the age of 8 months, but are probably present at birth, they consist in poor sucking power and swallowing reflex, screaming, bouts of cyanosis because of defective breathing, habit of lying in bed staring into space, convulsions. Generally the severe nature of the disease is realized by the mother when she finds that the child at the age of 6 to 8 months cannot sit up.

Ultimately when solid food cannot be taken, when the scissors-leg deformity appears, when the child is held supported by the nurse and when slight puckering of the face takes the place of emotional expressions, it is clear that the diagnosis is Little's disease. The mentality is variable, often quite good. Many survive only to become chronic invalids. The treatment is merely palliative; later on orthopaedic appliances may be required in order to counteract the effect of the paralysis.

Pink Disease.—This complaint is not very common; it generally affects children between the ages of 9 and 18 months. Symptoms of a cold with a temperature of 100° F. to 101° F., and some debility are the first evidences. The child, however, becomes very depressed and completely negative. Insomnia is a great difficulty. Within a month, there is a peculiar pink rash of the hands and feet, which are cold. Ultimately there is danger of generalized dermatitis. In bed the child prefers the knee-elbow position, his head buried in the pillow. There is nearly always considerable photophobia. There is wasting and flabbiness of all muscles. Later on general degenerative signs are manifest, indicative of polyneuritis. No treatment is of any use fundamentally. The symptoms can be alleviated by sedatives, good food and a change of air. Such cases are best kept out of the hospital; when this is so there is a recovery rate of 97 per cent.

Disturbance of Sleep.—A child may not sleep well because of a

choked nose, overfeeding, hunger, teething, unsatisfactory clothing (too much or too little), lack of exercise, enuresis, painful micturition, fear, exhibitionism, need for less sleep than others, too active a brain (e.g., by reading an exciting story at bedtime). All these must be reviewed in working out the individual case. Night terrors are generally associated with nasal obstruction such as adenoids, with the taking of too heavy a meal at bedtime; with lack of blood sugar (hypoglycaemia) and epilepsy. Drugs must be given only by doctor's orders.

NOTES.—The following subjects may be found in Section IX: convulsions, skin diseases, infectious diseases, rheumatism, tuberculosis (also in Section X), endocrine disease, diabetes mellitus; and in Section X: diseases of the eye, ear, nose and throat. Parasites are discussed in Section III.

Anaesthesia and the Child

Great advances made in the science of anaesthesia apply to children with special emphasis. Children are more sensitive to the anaesthetic than are adults. The era of purgation, starvation, use of chloroform and so on is past. The child is now prepared by premedication and the anaesthetic is allowed to have effect under the best conditions.

Preparation.—In order to avoid acidosis, ordinary food should be continued and use of purgatives avoided. If "Avertin" is going to be given as a pre-operative drug, the rectum will have to be washed out, but otherwise enemas are contraindicated. The nurse has nothing to worry about if she knows that the patient's bowels are in good normal working order. Constipation should have been dealt with some days before, unless of course the case is an emergency one. A light meal is permissible about 3 hours before the operation is due to take place. Plenty of barley sugar should be given for 2 days before the operation and on the morning of it also. Otherwise preparation of the child is similar to that of adults (see Sections VII and VIII).

Premedication.—Atropine will be ordered before ether is to be given. Infants generally have $\frac{1}{200}$ grain, but $\frac{1}{100}$ grain can be given to a child of 3 years. The injection of atropine should be given about three-quarters of an hour prior to operation; sometimes atropine is given by the mouth, in which case the dose is very much increased. Another drug is "Nembutal", given by the mouth, not objected to by children, and very effective; the dose is based on the child's weight and the nurse will be given careful instructions, generally being told to pour the dose out of the container, to mix it with some fruit drink and casually to ask the child to have it. It is best to let one hour pass before opera-

tion, the child being allowed to go off to sleep at once in a darkened room. The child will likely sleep until about 2 hours after the operation is over. "Seconal" is a similar drug. Anaesthesia may be induced while the child is still in bed, so that removal to the operating theatre does not disturb him. Opium preparations should all be avoided in the case of children as they tend to depress the respiratory centres.

Paraldehyde and "Avertin" may be given per rectum. The former is made up into a solution containing 60 minims for every stone of the child's weight; 10 times the appropriate volume of normal saline is added. This is given per rectum and very slowly about $1\frac{1}{2}$ hours before operation. The child is not disturbed by being wheeled into the anaesthetic room. This drug has effect for about 8 hours, sometimes more. "Avertin" is also administered according to the weight of the child. The solution, at a temperature of 100° F., is given as above, $\frac{1}{2}$ hour before operation. The only disadvantage is that it may not be retained.

Administration.—Nowadays there is no great difference between administration of anaesthetics to children and similar procedures applied to adults. The nurse is therefore recommended to review Section VII, Chapter 7. The best anaesthetics for children are ethyl chloride, "Vinesthene", ether, ether and oxygen (still the favourite), trichlorethylene and cyclopropane.

Spinal Anaesthesia.—The dose must be carefully adjusted according to the age. Light "Nupercaine" is said to be the best spinal anaesthetic for children.

Dangers. The nurse may encounter 3 main serious conditions in the child associated with anaesthesia and the operating theatre. These are 1. ether convulsions, 2. post-anaesthetic acidosis (formerly called delayed chloroform poisoning); and 3. status lymphaticus. Ether convulsions are associated with septic conditions and the hot humid atmosphere of the theatre and occur when the child is deeply under. Anaesthetists generally stop the ether and give oxygen. These fits do not persist afterwards. On the other hand the second condition mentioned above may come within the nurse's province. Delayed chloroform poisoning affects children more than adults. Vomiting begins 24 to 36 hours after the operation; the vomiting which is first bilious, then of coffee grounds type, goes on until there is serious reaction with raised temperature, jaundice, great restlessness and even delirium; the danger is onset of coma, which generally ends fatally in 2 or 3 days. Acetonaemia is proved by urine examination; the breath is also heavy with the familiar scent. So far as prevention of this complication is concerned, what has been said above applies, but when despite all the precautions taken or when chloroform administration has been inevitable, and the convulsions begin, the

stomach should be washed out and glucose should be given per rectum or intravenously or subcutaneously.

With regard to status lymphaticus, which causes deaths under anaesthetics, modern ideas are changing. Many say that this condition does not actually exist; certainly it cannot be recognized by ordinary diagnostic methods prior to operation.

Common Surgical Affections

Wide and constant reading will not in any way be a substitute for practical experience in a surgical ward. To this remark must be added the observation that every surgeon has his own way and his own instruments and special apparatus and only those constantly working with him can appreciate to the full how great is the work to be accomplished. In children's diseases there are certain special forms of surgical treatment applicable to all, and although for various reasons only a very few can be considered in the following pages, it is believed that when the material referring to children especially in Section X is added to the data given here, the nurse will have all the information she may require.

General Principles.—The surgery of children follows the same lines of general principles adopted in the case of adults. Probably the recovery power of the child is better, especially after accidents. The treatment for shock is similar to that already mentioned. Burns and scalds with shock are also dealt with as described in Section X.

Affections of the Alimentary System.—The nurse is referred to Sections IX and X for information on the following: appendicitis, peritonitis, colitis, hernia, intussusception, prolapse of rectum.

Congenital Pyloric Stenosis.—With reference to what has been said earlier in this Chapter on the subject of congenital pyloric stenosis, the following additional note on the surgical aspect may be found useful to the nurse. It is certain that results will be very good when the surgeon operates early. For this reason the decision should be reached in the few first weeks of life; delay is dangerous. Breast-fed children have a better chance than have children fed on artificial foods. The pre-operative treatment consists in reducing any dehydration that may exist, thus it may be necessary to give salines or glucose by the vein or subcutaneously. Atropine is not given. An hour before the operation is due to begin, the stomach should be washed out with normal saline. The child should be prepared for operation by being literally rolled up in cotton wool, kept in position by a domette bandage lightly applied. On the operating table the hands can be tied to the pillow. Before the surgeon begins, the abdominal part of

the cotton wool "suit" can be opened up and the flaps pulled apart. Local anaesthesia has been suggested more and more within recent years, but if a general anaesthetic be given, nitrous oxide gas and oxygen is to be preferred. The operation (Rammstedt's) is a very simple one; the knife is used to divide the tough pyloric fibres and the release of the tension can be observed at once. Sometimes the child is on the table for 8 minutes, generally about 10. Postoperative treatment consists in the usual anti-shock treatment, warmth being one of the first essentials. The temperature should be taken hourly for 6 hours after the operation; in the case of development of hyperpyrexia, an icebag may be put on the head and the heating stopped. Postoperative dieting follows the principles laid down for both breast-fed and bottle-fed infants, the normal diet being gradually restored. As a rule the treatment after the operation is as follows. If there be vomiting, the stomach may be washed out with saline in the first 2 days; "Pylostropin" is given every 3 hours, the dose being $7\frac{1}{2}$ grain of "Eumydrin"; salines are resorted to when the dehydration is still menacing; after the first day a suppository of glycerine is given if the bowels have not moved. The outlook is excellent, good nursing generally speeding up the curative process and attending to the intake of nourishment.

Hirschsprung's Disease.—This is also known as congenital megacolon. The picture is typical; the abdomen gradually enlarges until it dominates the whole situation. The swelling is caused by overgrowth of the colon and rectum. Boys are affected more than girls in the proportion of 4:1. The symptoms, apart from the obvious abdomen are first constipation and then irregular diarrhoea, which is due to bypassing of the main mass in the colon by fluid faeces. There is general anaemia and greyish complexion. Some success has been obtained by the surgeon performing the operation of abdominal sympathectomy. In some instances the resort to spinal anaesthesia has been satisfactory.

Diseases of Bones and Joints.—Various congenital conditions are seen in the out-patient department. Oxycephaly (tower head) is a condition of the head which is wide but short from front to back; the dome of the head rises to a point. The main symptom is headache. Arachnodactyly is a condition of the fingers and toes whereby the bones are long and thin; the term, spider fingers, is applied to such conditions. Sprengel's shoulder, or high-placed scapula, is occasionally seen. The affected scapula is smaller and higher up than the other, with the angle turned inwards; the arm on the affected side has not the same range of movements as the other arm.

Tuberculosis.—This subject requires a volume to do full justice to it. The various manifestations—spinal caries, tuberculosis of the hip and other conditions—are all referred to in Section X.

So far as tuberculous dactylitis is concerned, this is commonly seen in very young children, the fingers or toes, as the name suggests, showing a spindle-shaped swelling due to the inflammation



FIG. 160.—TUBERCULOUS DACTYLITIS.
X-ray showing involvement of all phalanges of the
little finger.

(By courtesy of the Medical Superintendent of Queen Mary's
Hospital for Children, Carshalton, Surrey.)

of the bone. Generally several bones are affected. When the bone breaks down, a sinus may form and the caseous material may be discharged. As a rule a new shell of bone is laid down (see Fig. 160).

Tuberculous Adenitis.—This disease, which is one of the commonest manifestations of tuberculosis in children is of the greatest importance. The glands in the neck are those chiefly affected. The history is generally one of sore throat then stiffness in the neck, slow swelling of little lumps and finally bursting of one or more of the swellings; such “runnings in the neck” were very common at one time, but the incidence is diminishing. If these runnings be not dealt with properly the sinus persists and there is permanent disfiguration. Donald Paterson states that in his

opinion nearly all cases of proved tuberculous cervical adenitis come to surgical removal or breakdown. The treatment must, therefore, be considered with this in view. Septic tonsils and bad teeth should be removed. Special splinting of the neck by rolling round cotton wool in wide strips keeps the head still and rests the glands. Generally, however, the glands require to be removed. This is done thoroughly and efficiently when the case goes to the surgeon early enough, and a good result is obtained. In the case of the sinus, the surgeon generally waits until the child's health has improved, then the area is excised and skin grafting is done over the affected part to obliterate the signs of the adenitis. Ultra-violet light and strong sunshine must be used with great discrimination.

Syphilis and the Child.—Congenital syphilis manifests itself in various ways and each sign is clearly recognizable. The nurse will benefit by a study of the signs of congenital symptoms for she will thus be able to identify the disease and take the necessary precautions. The following may be noted: rash of coppery colour on the skin, snuffles owing to disease active in the nose, kidney disease, false paralyses, condyloma of the mouth and anus, hydrocephalus. In the growing boy or girl the outstanding signs will likely be interstitial keratitis (stained glass window eye), peg-shaped teeth (Hutchinson's teeth), swelling of both knees, depressed bridge of the nose, squareness of the skull and perforated palate.

Rh-factor and the Infant.—Reference has already been made to this factor in Volume I, p. 152. If an Rh-negative mother conceives an Rh-positive foetus, the former may absorb some of the Rh agglutinogens from the latter and, as a result, form anti-Rh agglutinins. These in turn may be reabsorbed by the foetus in whose blood they may cause agglutination and destruction of the red blood cells, so that the newly born infant has a mild degree of jaundice. However, the danger to the next child is much greater, since further anti-Rh agglutinins will meanwhile have developed in the mother and may be absorbed by the second foetus in much larger amounts, so that a dangerous degree of haemolysis may occur and a disease known as erythroblastosis foetalis may develop; haemolysis will continue to occur until by bleeding and replacement transfusion of Rh-negative blood the agglutinin is removed. Vitamin K is also usually given. The mother should not suckle the child as anti-Rh agglutinins may be passed to the infant in her milk.

SECTION XIV

THE SOCIAL ASPECT OF DISEASE

CHAPTER 1

THE ERA OF SOCIAL MEDICINE

SOCIAL MEDICINE. DEVELOPMENT. SCOPE OF SOCIAL MEDICINE. SOCIAL DIAGNOSIS. CONSTITUENT FACTORS OF HEALTH. SOCIAL PROGNOSIS. THE INDIVIDUAL AND EFFICIENCY. MISFITS. IMPORTANCE OF THE INDIVIDUAL. THE PERSONAL EQUATION. THE TASK AHEAD. CAUSES OF ILL-HEALTH. INVESTIGATION. STUDY THE PATIENT. THE IMPORTANCE OF CONVALESCENCE. PRINCIPLES OF RE-EDUCATION. REHABILITATION. ROUTINE OF RE-EDUCATION AND OCCUPATIONAL THERAPY. OCCUPATIONAL THERAPY. HOLIDAYS. RETURN TO WORK. AFTER-CARE.

THE rise and growth in importance of social medicine has been inevitable in the conditions which are associated with civilization in all its aspects and phases. In order to appreciate to the full all the complexities of medicine—particularly therapeutics—as it presents itself today, it would be necessary in fact to begin at the beginning and study mankind itself; here indeed our knowledge would not be complete in any sense. Progress in medicine has always been insidious; it is true that there have been various events which have brought about revolutionary changes and have caused sudden spurts in the advance—antiseptic, inoculation, chemotherapy, penicillin spring to the mind—but on the long road on which therapeutics has travelled there are so many milestones that it is impossible to do more than survey the evolutionary track; our minds must be fixed on what we see now. The complex entity covered by the term, modern medicine, is the result of experience of mankind in the search for and maintenance of health. And when the process is subjected to analysis, once again it becomes clear that health in all its aspects is the sum of the reactions of the organism in its environment and of the influences effected by that environment. This concept can be applied to every branch of modern existence and from it the principles of hygiene may be determined as they apply to the particular conditions controlling life and living in any given situation, simple or multiple as these may be.

Social Medicine

Within recent years there has been a growing tendency of doctor and layman to seek some philosophy—Professor Ryle calls it a scientific discipline—which would be the basis of all healthy living. The enormity and the comprehensiveness of such object may be appreciated by reference not only to the multifarious branches of medicine itself but also to the great pattern of modern human life, individual and collective, urban and rural, industrial, intellectual, cultural and so on. To this general concept the term, social medicine, has been applied. Since it seeks to adjust all organisms to all environments and thus to obtain for mankind the optimal physiological and psychological reactions, it must have far-reaching ties and influences with every factor which enters into social science; indeed, it is difficult to see where or how social medicine can be said to stop. With these broad principles in her mind, the nurse may find that further analysis brings into prominence many fundamentals of hygienic science and explains more fully many of the basic elements of nursing practice.

Development.—The beasts of the field and the fowls of the air do not require any social medicine; obedience to instinct, absence of fear in the human sense, reaction to environment in a purely physiological manner—these and many more make the animal life independent of any but natural laws. With the human being conditions are different; this is not the time or the place to enter into any lengthy controversy with regard to Man's evolution but the facts are that the human race, whatever its predestined function may have been, sought to become "civilized"—a term which has to be used for want of a better one—and civilization, gathering its ungovernable momentum, has brought us to the chaos of modern life. Social medicine is obviously the effort of the imprisoned organism seeking to adjust itself to the environment, if not to effect a change in the environment itself. For over a decade, governing bodies in medical education have been striving to bring instruction to medical students and all associated with them in the fundamentals of assessment and maintenance of normal health as well as in the principles and practice of disease prevention. Such awakening to the needs of the present day has occurred not only in Great Britain, but also in America and in Europe. Great researches are already in process; many more will be required before we can say that we have touched the fringe of the subject so far as basic knowledge is concerned. But there is not the slightest doubt that social medicine has come to stay, and when all the factors responsible for our present-day way of life are examined, it will be clear that

medicine, psychiatry, geriatrics (science of old age), statistics of medical and sociological subjects, social pathology and the science of health in general, must all be of the greatest importance in the quest for a philosophy. That the ultimate attainment of such philosophy will mean the complete readjustment of medical science there cannot be the slightest doubt. Lastly, social medicine in its development must be regarded as the natural reaction towards the simpler life and against the technicalities and artificial mechanisms which have swamped humanity in the past two centuries; Man seeks now to be himself and to express himself in a more natural way—furthermore he has at last realized that alleviation of disease, essential although it may be, is the end and not the beginning of health. What is now eagerly desired by us all is the science of health and the knowledge of its establishment and upkeep. There is no doubt that some revolution is inevitable; we know that the causes of disease—bacterial, nutritional and so on—lead to disaster, and our efforts must be turned now to the social environment in its every department which allows such causes to operate.

Scope of Social Medicine.—Where then does social medicine begin and how much has it spread so far? It is accepted that its limits are indefinite, but some assessment must be made of the advances that have been made. In the consideration of any particular subject or disease or social item, we must always rely on the main principles and seek to apply them to the full amount. The nurse sees her patient in the bed in the ward; this patient must never be a mere number to her: a dictum such as this is happily unnecessary in the great majority of cases. Medical science demands much up to a point; for instance, the patient must be kept clean, well fed, comfortable, in good spirits and in a positive mood towards recovery; he must have all possible alleviation of his distress and the maximum amount of curative application. But to consider the patient merely from the point of view of his temporary environment and condition is now well outdated. Social medicine demands that when the patient steps out of the hospital gates some investigation of and in fact fair appreciation of his domestic and industrial background will have been accomplished, so that his ailment will not be encouraged to recur and indeed that his life in the future will not be assailed by disease elements as it has been in the past. The nurse is clearly charged with the moral duty if nothing else of playing her part in enlarging the effort for any particular patient and thus assisting in widening the scope of therapeutics and making available the benefits of social hygiene.

Social Diagnosis.—Some kind of grading or categorization of the individual may be envisaged; this does not mean that every citizen should have a number and be regarded as a mere

cipher in the mass of people, nor can it be professed that entirely accurate categories can be compiled of human beings in general. But this can be said: it is possible to collect all the information regarding personality, environment, peculiarity, activity—to mention but a few—and thus to gain some idea, however vague and incomplete, of the type of individual under examination. Now it must be realized at the outset that before any semblance of a true individual index is reached, long and patient investigation must be made of all the influences which are in operation in the physical and mental environment. This means that the investigator or diagnostician—call him what we may—who may be doctor, nurse or layman, must be prepared to face many difficulties of investigation and must be resolute and painstaking in his or her quest for the important information sought. There is no limit to the scope of the examination; medicine, economics, social conditions, heredity, nutrition, education, industrial patterns and many other branches of sociology may all be reviewed, and doctors, nurses, almoners, pharmacists, health visitors, welfare workers, laymen with special qualifications and the neighbours at home, at work and elsewhere must all participate in the compilation of the facts that will in summary be used to allow an index to be arrived at. This great diagnosis is no more than an expansion of the restricted system employed by the ordinary physician, but the resultant prognosis will be widened in its scope and in every respect will be more accurate.

Constituent Factors of Health.—Social medicine, then, is a matter of coordination of all factors, and although some have been studied in greater or lesser degree before now there are many which are more or less new to the philosophy of medicine as a whole. In analysing the subject, it might be argued, for instance, that Public Health, with its many branches, covers much of what is now referred to under the heading of social medicine. It is true that public health measures have done much to broaden the basis of hygiene or social hygiology, but as Ryle has emphasized, public health has dealt mainly with the environment and not in equal degree with the organism. Furthermore, the term, health, whether regarded personally or as belonging to groups, communities or even nations themselves is not a matter of epidemiology, community health or prevention of community disease alone: it is a matter on which all the factors mentioned in the previous paragraph have an important bearing, and thus not only so-called infectious (communicable) diseases, but indeed all prevalent diseases, must be considered. Under the latter heading may be grouped the all too familiar rheumatic diseases, ulcers of the stomach and duodenum, heart diseases and cancer, not to speak of the accidental injuries associated with the modern industrial life. Yet another expansion of public health, not con-

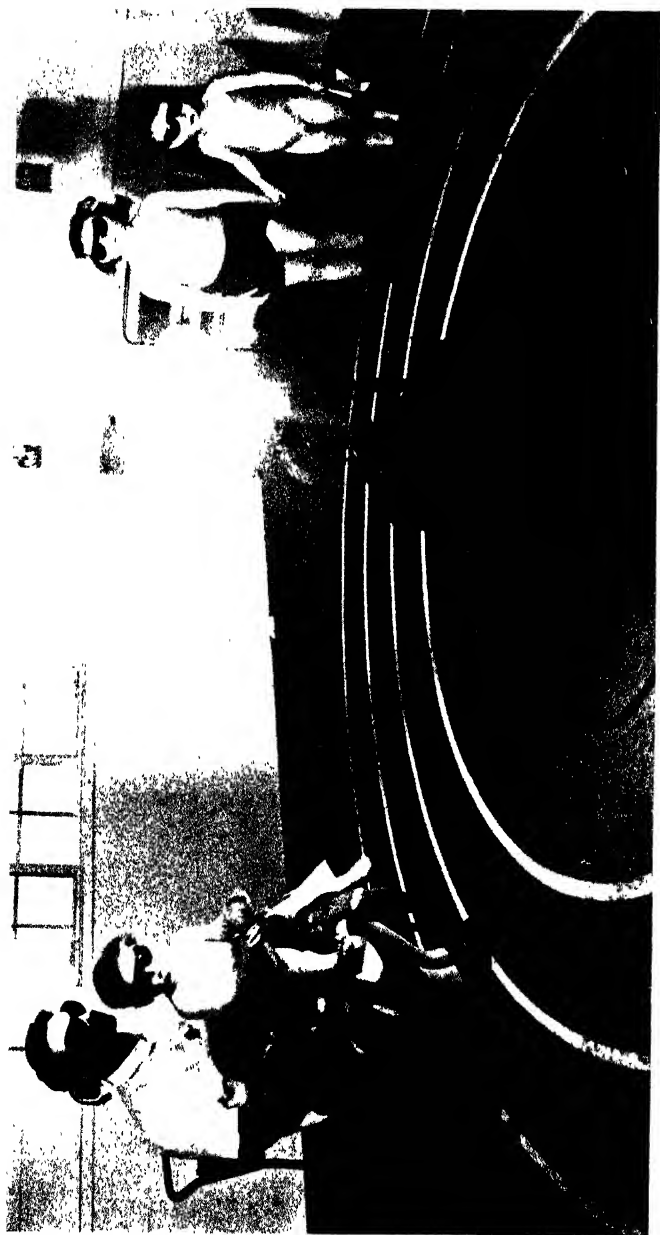


FIG. 161 —CHILDREN HAVING ACTINOTHERAPY AT A SOCIAL CENTRE CENTRO-SOL APPARATUS;
(B, *coats*) of *Massey, Harcourt Ltd, S.W. 6.*)

cerned with disease prevention, but based on the need for raising of the basic health standard, is closely related so as to become identical with the principles of social medicine. Much of the school medicine, the welfare centre work, the health visiting and the education in health available to the community is indeed founded on the basis of social hygienic principles. Social medicine begins with the individual and expands all round, more and more involving the environment in its applications. Here it must be clear to the nurse that the work of the almoner or similar type of social worker already referred to above is of the greatest importance; her observations help towards an assessment of total circumstance and towards the provision of greater opportunities for health.

Social Prognosis.—When all the data obtained are collated and when the picture of the investigated person becomes clear, it is time to make the various assessments and to come to certain conclusions regarding the health career of the patient. Such prognosis must be based on special and general factors, and must take into account the personal and communal influences which belong to the patient's make-up. As in diagnosis, the outlook must have the widest vista; all kinds of influences must be considered. For instance, we may have to ask ourselves what the housing conditions for the patient may be for the next 20 years, what the supply of food will amount to, what effect will his job have on his health, what will his chances of accident be, what will old age bring in the way of physical defect or monetary limitation, what social changes may be envisaged and what effects political and international strife will have. Finally, taking into consideration all these elements and the type of human being under review, we may have to envisage what his reactions may amount to in the years ahead of him. This is indeed no easy task, but even if it be partially accomplished it will help the cause of health in eliminating to some degree the surprise element, which is always the dangerous weapon in the hands of sickness, and it will also keep our minds alive to the prevention of conditions which lead to sudden, unexpected cataclysm, grievous war, penury, hunger, distress and all the horrors of a relapsing civilization.

The Individual and Efficiency

An army is recruited by selection of men coming up to certain accepted standards of development and bodily efficiency, and thus it is as a whole a unit capable of certain exceptional performance. There are many other examples, of the grading of human beings, especially for government and other public service, and even occasionally in civil occupations. As a rule,

however, the great mass of the public do not have to be examined compulsorily before they can go to a job in the ordinary field of labour. The result of this is that for any given occupation it is possible to engage men and women in all conditions of development and of health. Occupation involves the consideration *inter alia* of 2 main points: physical efficiency and mental aptitude. The worker who is not "screened" before being taken on for a job goes to the latter in the hope that he may suit the job and that the job may suit him; he may be quite incapable of making any prognosis about himself. Much less can the representatives of the employer (managers, foremen, charge hands and the like) be able to judge as to the suitability of the newcomer. In the majority of cases it is a matter of trial and error, and unfortunately it is often discovered that mentally or physically, or both, the square peg has once again been found in the round hole.

Misfits.—It is a blessing for all concerned when incompatibility of worker and job are to be found at an early stage, for in such circumstances, the mental or physical maladjustments may early be remedied perhaps by change of occupation. Unfortunately, in cases of breakdown it is the rule rather than the exception to discover that a worker has managed to remain for some considerable period at his or her job and has actually given satisfactory service or had sufficient output during that period to avoid criticism or even dismissal. This kind of adjustment of organism to environment may be examined from various viewpoints, and apart from any betterment of working conditions, machinery and so on, the personal equation alone may be dealt with. Here there must be investigation into the physical or mental reactions (or both) of the person under review, and some idea must be formed of the energy expended and the wear and tear of the bodily machine or the actual damage done to certain parts. A little reflection will afford proof of the great difficulties in investigation. Who can say offhand that a worker is lifting every 5 minutes a sack which is overloaded by about 5 lb. for his physique, and who can decide just how much exhaustion is produced after 8 hours of this work? Yet perhaps after 10 years of constant work the selfsame worker will consult his doctor because of symptoms which are easily recognizable as those of heart failure. Again, is there any accurate way of making assessment of the amount of mental strain put on an impressionable young woman who has to work at a spinning-frame in ear-splitting din and choking dust for hours at a time? She may be classified as a careful, reliable and efficient spinner, but who can tell how much her mind is being overwrought by the need for constant adjustment to such baneful conditions? It is almost certain to cause surprise

when the woman suddenly has what is termed euphemistically "a nervous breakdown," and when information is brought that she is in hospital and mentally ill. These illustrations will no doubt help to emphasize the difficulties of investigation and of interpretation of symptoms and signs of industrial maladjustment; that such things are important, however, there is not the shadow of a doubt, as industry is today discovering to its own cost.

Importance of the Individual.—The efficiency of the individual, therefore, is a matter which is not only his own private concern, but the concern of everyone associated with him. In fact, such efficiency is now regarded as a national matter, for manpower is of the utmost need, and the conservation of human strength and energy is of paramount importance. The contribution made by each worker affects the combined output; when the units are weak the total result must be disappointing. With the workers of the older age groups, alleviation of bodily defects only can be done; looked at as a long-term proposition, social medicine, to make the worker of maximum efficiency, must wait for many years for its results. Undoubtedly, the gradual improvement now in evidence among entrants to industry is likely to leaven the whole mass of workers, but it is surely obvious that it will be a long time until every year will see new batches of entrants, the products of the philosophies of social medicine, pass into the workshops, fitted in every respect for the job which they have chosen, or for which they have been advised to apply. Suitability for a job can never be absolutely determined, despite the most careful physical examination and psychological investigation, but this can be said: intelligence and other tests carried out to determine the best environment for the particular organism have been proved in the main to be very helpful; experience of such methods in the Services and elsewhere and in schools encourages more widespread adoption of such measures.

The Personal Equation.—No matter what may be appropriate in the attempt at determining the ideal occupation for any man or woman, there must nevertheless be certain additional factors for consideration, and thus apart from all modern scientific and objective tests, there remains the enigma of the individual himself or herself. That rare and happy person who finds the Golden Age and knows that his or her own main occupation—domestic, industrial, clerical, intellectual and so on—is completely satisfactory, has undoubtedly gained an enviable place in society. It is hard to believe, however, that in these days of complex civilization there is anyone who in all respects—home life, working life, social life—is perfectly in harmony with his surroundings in each category. For

instance, it is common knowledge that the man skilled at his trade or profession may not be the ideal man about the house; the good cook may have a bad temper.

The Task Ahead.—The nurse or any other worker in social medicine must realize how great in magnitude is the task ahead. It is impossible to predict when enlightenment of the human race will be complete and when all human beings will be disciples of hygiology. The more the work goes on, however, the better the chance of the millennium. No task is too small, no item of information too unimportant. The increase of the individual's contribution means much to the national life, and every effort made to improve the output or increase the efficiency, whether the latter may have been only temporarily reduced or not fully displayed at any time, must improve the quality of the nation as a whole.

Causes of Ill-Health

Despite the pious wish that all may soon become devotees of the cult of social medicine, there remain the cold facts of statistical evidence; millions of people all over the world continue to fall ill. For the present, such conditions must be accepted as inevitable, and although periodical reports on sickness, epidemics, death rates and the like show encouraging decreases in incidence, there is no doubt that we have a long way to go until acceptable figures can be published. Meanwhile, all medical and other workers in social medicine, including nurses, will find more than enough work awaiting them in the alleviation of existing ills, as well as in the prevention of others.

Investigation.—In any clinical examination it is good practice, as all nurses well know, to investigate completely and thoroughly the events and conditions associated with the disease. As mentioned at the outset of the present chapter, however, social medicine demands much wider enquiry into the condition of the patient and of his surroundings. This may mean teamwork, for, in order to gain reliable knowledge of the total aetiology of the disease, investigations may have to be made at the patient's home, at his workshop or in any other of the places which constitute his environment. The work of the almoner and of the health visitor or of any other trained person who has studied such environment must be given important places in the general aetiological survey. It must always be uppermost in the mind that no single causative factor is useless in building up the picture. When all the causes have been sought, and when it can be truthfully said that every alley has been investigated, then it is time to marshal the facts and to consider each in order of its importance. Some clearer picture

may then be obtained of the general and particular background against which the patient stands, and undoubtedly much better understanding of the adjustments to be made will emerge. The outcome of all such investigation will be seen when the physical cure of the illness which has caused the breakdown has been effected and when the re-education and rehabilitation of the patient have to come under consideration, as described later in this chapter. A more detailed study is made in the chapter which follows of the practical methods of determining the background of ill-health; meanwhile, some further study of the general situation may be made.

Study the Patient.—It is essential to gain full knowledge of the patient's surroundings as he goes the daily round, but it is equally necessary to have an understanding of the patient himself—the organism. Now this does not mean that any isolated investigation by a psychologist or other worker in a purely psychological sense is to be envisaged. The anthropology must be considered in all its aspects, and some effort made to grade or classify the individual, as referred to earlier in this chapter. A moment's reflection will convince us that however much we may probe, we shall have little hope of knowing all there is to know about the organism under review. There is obviously a bewildering multitude of mental and physical traits, of habits, of personality factors—indeed, of ways of living—and it is incomprehensible that a single person or a team of investigators should file the card with every heading completed. The aim, however, is to go as far as possible towards that perfect example of completeness; in the present era of specialization the mental and physical make-up can be determined to a certain degree, but after the individual has been labelled as extrovert or introvert, asthenic type or pyknic type, and graded in a category which is of general application, there is the limitless field which comprises the small individual peculiarities and idiosyncrasies, otherwise personality and personal make-up. These are every whit as important as the greater criteria.

Observation of the patient by the nurse is therefore very important, particularly as regards the less obvious features. In the many interviews which a painstaking nurse will hold with her patient, she will continue to note any physical qualities (anatomical or physiological) which are abnormal, and also any mental reactions which appear to her to be unusual. Such findings, when carefully compared with the environmental factors outlined above, may give clues to the cause of the accident or the sickness which has brought the patient to the hospital bed, and once more a better knowledge is provided for the application of the most suitable measures in ultimate re-education and rehabilitation. All the above refers to the

man or woman in the sickbed, but we have to go much further afield and envisage the patient as he behaves in the home, at work or in the general daily routine. Collaboration with the social worker, health visitor or other person who knows the patient in his or her usual sphere is therefore of the utmost importance, and knowledge of the patient's mental and physical reactions to his occupation as well as his general attitude of mind and body to his social contacts should be gained from all reliable sources. One great essential is that the nurse should assess the patient for what he is and not for what he is supposed to be; hearsay evidence is therefore of little value, except as confirmation of the expert observation. Thus, habits, ideas, hygienic principles, mental attributes and so on, must be appraised after fair observation; for example, the virago wife of the man who escapes to the public house to have a glass of beer may refer to him as a drunkard, but in fact the man may be proved to have a small appetite for alcoholic refreshment; again, the casual neighbour may refer to the woman next door as "always bright and cheerful," when indeed this mask has been assumed in the presence of outsiders to cover unhappy marriage.

The Importance of Convalescence

From what has been stated already it must be clear that in any attempt to correct the hygiological errors, the work must begin immediately after the patient comes under medical care; all the way through the illness efforts should be directed towards the earliest resumption of the state of what to the patient is his "normal" health. The main offensive must be directed, however, when the state of convalescence is reached and when the lesion has been healed and all that is wanted is mental and physical rebuilding, to a physiological process of return to the ranks by the most suitable route. Physiologically the bodily machine produces so much heat and so much work according to the individual needs; to each person there is the optimum production, this depending upon bodily and mental efficiency for a specific piece of work. After illness, the mental and physical springs are run down; the clock requires to be wound up before it can be expected to resume normal time and rhythm. The period spent in such priming of the bodily machine is generally referred to as convalescence, and it is well known that the latter is short or long, according to the state of the body or mind, or both, of the individual patient. It needs no emphasis to point to the great importance of this era; with the advent of social medicine and with the acceptance of the more widely understood tenets of health, it is natural that many considerations now come into the study of the case. First there is the matter of



FIG. 162.—CONVALESCENTS DOING PHYSICAL TRAINING IN THE OPEN AIR.
By courtesy of the Medical Director, Roffey Park Rehabilitation Centre.

re-education already referred to elsewhere and still to be considered in detail later on; secondly there is the subject of occupational therapy and training; thirdly rehabilitation is an essential branch of all medical therapy referring to industrial workers. These measures involve co-operation of physiotherapists and occupational therapists and a general planning of convalescence with a graduated programme for the patient that will help him to become in all respects fit for the outside world as quickly as possible. In order to have a full appreciation of the situation, it will be necessary to spend some time in studying each of these subjects, especially to learn how complete is the coordination of all measures planned to guide the sick person to health and to fitness for his job. Every hospital of any size has its rehabilitation department, and rehabilitation is carried out in the medical department of all the large factories and other centres of industry. In some cases, rehabilitation demands residence for a period at a special hospital.

Principles of Re-education.—The man or woman who has perforce to be put in the sickroom—no matter whether it is a question of illness or accident, and no matter whether the place be the home or the hospital—is from the point of view of national economics, a “passenger” for the time being. He or she is out of the competitive routine, and is not expected to contribute anything but the minimum towards maintenance or in the way of service to the community. In saying this we do not intend to convey the impression that the casualty cannot make monetary payments for his lodging, food, upkeep and medical attention during his illness; compulsory or voluntary saving will to varying degrees ensure that such service is paid for at least in part. But the sick person has ceased to earn any money; for the time being he cannot give his labour, whatever it may be, and therefore he is not able to turn such labour into cash equivalents.

The first point to be established in the nurse’s mind therefore is that the patient is almost entirely passive; obviously, as an economic factor he is negligible for the time being. The second item for consideration will probably be that which concerns degree of disability and the amount of change that has occurred in the value of the patient as an economic unit; the question may be asked: how great is the ultimate reduction in working power to be, and by how much is the patient to be handicapped? These general factors demand very careful deliberation, and the whole aim nowadays is to use every measure in order to regain for the patient the maximum amount of his labour potential.

Rehabilitation.—The term, rehabilitation, is one which is on the lips of the majority, yet on careful investigation it will be found that only the few really appreciate the full meaning of the word. It is one which is capable of wide interpretation and

which must be defined and accepted as one which comprises many kinds of therapy—physical, mental and occupational. The nurse must never allow it to become established in her mind that rehabilitation is governed by any rule of thumb; it is true that general principles have been established and that all rehabilitation work is carefully planned to apply most successfully to the various conditions for which it is used. But there are no hard and fast rules in individual cases; indeed, in each case, and for reasons which have already been given, the personality of the patient has to be taken into account and the programme devised accordingly. In rehabilitation there is no



FIG. 163.—TONIC SUNBATHING AT A MINERS' INSTITUTE.

(By courtesy of Messrs Hanovia Ltd., Slough.)

better illustration of one man's meat being another man's poison; it will soon be evident to the nurse engaged in this branch of work that extraordinary pains must be taken to suit the different types of therapy to the patient and to the disability, whether the latter be surgical, medical or mental.

Rehabilitation begins the moment the patient has recovered from the immediate shock of the accident or of the onset of the illness. It is essential to keep in mind that the end of an era is represented by the accident or the start of the medical disease. Once the patient has become a casualty there should be only one aim and object, not only on the part of the doctors, nurses

and other attendants, but also on the part of the patient himself: to get back as quickly as possible to the "normal" state, or what is to be the end-point of the process. In accident cases, of course, this philosophy bears its fruit more obviously and perhaps more freely; the days are past when the fractured bone was splinted and the limb immobilized for weeks and then would arise the fresh problem of making a stiff and wasted limb function to the best of its ability. The modern methods of such treatment are referred to in Section X, and it is unnecessary to reiterate what has already been said; but it must be emphasized here that one of the main elements of rehabilitation is that maximum function should be preserved and that tissues should not be allowed to degenerate or waste for want of being employed. This is indeed the main principle of early treatment of injury and a very important fact is that the patient must be encouraged to collaborate to the best of his ability, so that the rehabilitation process is one of teamwork in which medical specialists of all kinds collaborate to offer to the patient every possible modern kind of assistance to give him the best chance of doing as much as he can for himself. Rehabilitation is never to be looked upon as a passive system of treatment; indeed, it should be regarded as failing in its function when in any case the usual amount of active treatment has to be limited.

Incidentally, it should be brought to the nurse's notice that since many casualties do not reach the hospital bed, the ambulant cases may have rehabilitation treatment in various ways outside, especially at the casualty department of the factory or other place of work. A great and increasing amount of rehabilitation is now being done most successfully by the industrial medical officer and by the industrial nurse.

Routine of Re-education and Occupational Therapy.—

Now we must turn to the practical aspects of rehabilitation and associated therapies. It will be agreed that the accident case furnishes the best example of type of patient, for here there is the greatest scope for rehabilitation, especially if, as so often happens, the patient is young and otherwise healthy, with bodily organs at their maximum efficiency. The surgeon and the orthopaedist will determine the extent of repair to be done and will perform operations or advise mechanical treatment by which the maximum function of the limb or other part will be assured. Once the reparative process is over, the era of readjustment begins, and for the first few weeks, perhaps, only the health and function of the injured part is dealt with. The patient is limited by being in bed, often in splints, and in this, the most passive of the phases, the physiotherapist and the orthopaedist will be mostly in the picture. Massage, electrical treatment and testing, movements and various other physiotherapeutic measures

may all be employed, and it is more than likely that the orthopaedist in charge will plan for early participation by the patient, the first very small active movements being encouraged.

Under the constant supervision of experts and with every known adjunct to healing in operation, the patient is bound in ordinary circumstances to recover in the shortest time. The healing of the lesion marks the beginning of a new phase. Despite the possibility that the tissues may have been kept free from wasting processes and that function may have been preserved all through, there is inevitably the situation to be faced that muscles, tendons, bones and joints, not to mention circulatory and nervous elements, have not been asked to do their full work. Function to the maximal degree is therefore the next target, and this emphatically demands the collaboration of the patient. Thirty years ago men and women were sent from hospitals with stiff joints and wasted limbs, and they were told to "convalesce" on their own responsibility; nowadays, the re-educative process may keep the patient under direct medical supervision for several months, depending upon the injury. What are the methods used to develop the maximum power in the affected part?

Occupational Therapy.—The orthopaedic surgeon will no doubt

review the case when the patient is allowed up and has reached the stage having a sound scar or scars. There are various possibilities with regard to the future, and these will be passed in review as the surgeon studies the facts of the case as a whole. Some of the questions which arise are: will the man be able to do his old job efficiently—i.e. is his earning capacity in all respects unimpaired?—if there is permanent disability owing to inevitable injury to tissues or amputa-



FIG. 164.—OCCUPATIONAL THERAPY OF SEDENTARY TYPE.

By courtesy of the Medical Director, Roffey Park Rehabilitation Centre.)

tion, what is the restriction on work and what kind of work may be most suitable?—is there still some temporary disability which further treatment will banish? As already mentioned, every case has to be made one for special study, and a knowledge of all the social and industrial factors must be in the mind of the medical officer in charge of the case. Let us examine the case of the man who has a healed lesion, whose tissues have been maintained at maximal possible efficiency, but who when he gets out of bed, finds that he is restricted by various limiting factors in carrying out the full function of the limb or limbs. He may lack strength of muscle to keep the limb even in elementary function for the shortest time; he may be incoordinate in his movements, requiring to be re-educated once more in walking; as a result of the injury he may find that certain movements (pronation, rotation and so on) are lost or limited; he may be acutely pained when he attempts to move a joint. How does the treatment begin?

The surgeon will probably decide with regard to the immediate amount of further treatment required, and this is the institution of the planned convalescence, where work and play, occupation and recreation alternate and in which the daily time-table is as carefully planned as is the weekly routine of a school. Various periods are allocated to the physiotherapist, to the physical training expert, to the occupational therapist and to the nurse, the last being responsible, amongst other things, for the domestic aspect of the patient's daily round. Certain periods are reserved for rest and recreation. Most important of all, the patient has "time-off," for part of his re-education consists in allowing him to gain self-confidence and, so to speak, to be his own "boss."

In the above programme, all the forms of therapy and all the various types of appliance, electrical, gymnastic and mechanical, already described in the chapter on physiotherapy in Section VIII, are brought into use appropriately. Massage may also be ordered. Many kinds of therapeutic baths are available; mud packs, wax baths and other special types of therapy may be made use of. Needless to say, the treatment is carefully graded, and the patient is never allowed to be unduly fatigued. A speciality is made of cooperation by the patient; he is constantly encouraged to know what is going on and why it is being done, and he is urged to concentrate on the progress of recovery.

At some suitable time the occupational therapist may be called in. The majority of nurses know that such qualified assistants are trained to direct and supervise convalescents who are put to work at various occupations in which anything from basket-making to operating a lathe or hand-loom may be included. There are two classes of convalescent: in the first are those who do not necessarily do work to which they are normally accustomed; in the second are those who happen to



FIG. 165.—INDOOR PHYSICAL TRAINING CLASS FOR FEMALE CONVALESCENTS.
(By courtesy of the Medical Director, Roffey Park Rehabilitation Centre)



FIG. 166.—OCCUPATIONAL THERAPY ; WORKSHOP AT A CONVALESCENT HOSPITAL..

(By courtesy of the Medical Director, Roffey Park Rehabilitation Centre.

be skilled at certain work used in the process of occupational therapy—these are not commonly found in any group. We may accept it as likely that occupational therapy is merely a means to an end and that the occupation is one which is temporary. However such work may be taken up, the real index of its suitability is the progress of the patient, therefore certain kinds of work and certain types of machinery are generally adopted by the occupational therapist, e.g. the pedal-operated machine, the spokeshave, and so on. In looking at occupational therapy in its widest vista, the limitless possibilities are to be noted. In mental disease, in psychoneuroses, in the case of women as well as men, for the intellectual and the labourer, occupational therapy has its uses. The brain-fagged professor may improve rapidly by digging in the garden, whereas the railway porter who has had his fingers injured by a carriage door may find that making rugs brings back the function to his fingers most quickly.

For those who have reached a later stage of rehabilitation, games, physical training and gymnastics, all carried out under



FIG. 167.—OCCUPATIONAL THERAPY : GARDENING.

(By courtesy of Fox Photos Ltd., and the Medical Director, Roffey Park Rehabilitation Centre.)

the expert, have an excellent curative effect. Games—especially ball games conducted as a class—improve concentration, coordination of muscles and reaction time, and in many other ways improve the morale of the patient. It will be evident to the nurse how much positivity there is in the scheme; at no time is the patient allowed to think of himself or herself as a crock

or as a hopeless case. Every new achievement is pointed to as an argument for another step forward, and it is satisfactory to know by the reports from various centres that good results multiply rapidly.

Holidays.—It is generally inadvisable, except in special cases, that a patient should return straight home, whether he chooses to go back to work immediately or not, after any fairly long course of rehabilitation. A holiday is generally advisable, and for the chief reason that it regains for the patient that sense of real independence and self-reliance which is required before it is possible to return to the world of economics again. Many spas are now considered to be suitable places for continuance and ending of convalescence, because apart from their facilities, which are available in the case of relapse or breakdown, they generally have ample facilities for recreation, music, amusement and games. The climate is almost certain to be suitable. In Soviet Russia much stress is put on spa treatment for debilitated and injured workers.

Return to Work

Inevitably the time comes when from the point of view of intensive therapy nothing more can be done for the patient, and he is faced with the possibility of fending for himself. As already made clear, any permanent residual disability will always be noted and every effort made to compensate the worker for his loss of earning capacity; much legislation has been brought about with regard to this, and there is no need to dwell on the many-sided problems associated with workmen's compensation and the like. Assuming, however, that in cases of partial disability the permanently disabled person has been amply compensated by having his reduced earnings made good by allowances, there is the great problem of reinstatement in the labour world. In some cases the worker finds that he can undertake work of an entirely different character from that formerly done, and here the re-educative process of rehabilitation may be of assistance in guiding both employer and employee. In many other instances the worker may require a few weeks probationary trial (we might term it "acclimatization") at his old job; assuming that there is no permanent disability or a very slight one that can be physically compensated by development of the patient's coördinative muscles, the former earning capacity may be restored to the full in a very short time. Meanwhile, facilities are in existence in almost every factory or workshop of any size for expert supervision and assistance of those returning to work after injury. In some cases in which permanent injury or disease is present, special work may be

reserved. As typical examples of this may be mentioned the department in the Ford Motor Works in Detroit in which there is a section staffed only by those suffering from tuberculosis, and also the recent establishment of a scheme for centralization of miners with silicosis in a special institution in which various suitable occupations may be taken up.

After-Care

In conclusion, reference must be made to the great importance of what is called "follow-up" (an inadequate term at best) and after-care. The services of all orthopaedic and physiotherapeutic departments should invariably be available to those who may have need of them, e.g. in cases of temporary relapse. Careful records kept up-to-date are always helpful, and cooperation between factory medical staff, the patient's own doctor and the hospital specialists, will ensure that nothing is left undone to see that the casualty is properly looked after for a long time after he has gone back to his own job or has accepted another of suitable type.

In the foregoing pages we have taken, as stated, one example only, and used it to explain the course of rehabilitation. We must not forget that similar facilities should be or are provided in the case of the school-child, the parturient woman, the shop assistant, the typist, the professional man—indeed, anyone, who for one reason or another has had to stop work on account of illness or accident.

CHAPTER 2

THE BACKGROUND OF ILL-HEALTH

THE IMPORTANCE OF PUBLIC HEALTH. HOUSING AND ILL-HEALTH. THE HOME. OTHER FACTORS CONTRIBUTING TO ILL-HEALTH. WORKING CONDITIONS. HABITS. HEALTH PROMOTION. DOMESTIC HYGIENE. INDUSTRIAL HYGIENE. STUDY OF THE INDIVIDUAL. PERSONAL INDEX AND PROGNOSIS. INVESTIGATION. RECORDS. CONCLUSION.

So much has been done by legislation that it has been alleged that so far as health is concerned there is an Act of Parliament for every act performed by the modern human being. The recent passing of the National Health Service Act has represented the consolidation of many measures all directed towards reduction of disease incidence, and although the emphasis at the moment is on treatment of disease and on limitation of disability, there can be no denying that in any well ordered community the ideal should be the destruction of all elements that tend towards the setting up of ill-health among the inhabitants.

The Importance of Public Health

Hygiene has many ramifications, and the great machinery of public health is an example of its importance; nevertheless, the difficulties of the public health officers appear to increase rather than to diminish with the advance in civilization. A study of the ordinary history of any nation covering the period of the last 200 years will answer many questions raised about the health of the common people; development of mechanical power, discovery of the potentialities of electricity, rise in importance of the internal combustion engine, these and many more explain why personal hygiene and social medicine may have been allowed to remain in the second or even third places in the race for so-called civilization. The health of the people has never really caught up with the industrial advance, and in the present century we have had two wars, the greatest in history and devastating in more than one respect to humanity, so that the gathering momentum of present-day reaction towards personal health and better hygienic conditions everywhere is

not unexpected. There is so much to be done that it is difficult to know where to begin, but before any remedies may be discussed, the most careful examination must surely be made of the ground on which new edifices are to be built; in many cases that ground contains the mouldering bricks and rotting timbers of former trials and errors, chiefly the latter, but such ruins must be investigated if for nothing else than that we have to find out why and how mistakes were made. In the present chapter, therefore, an attempt is made to get down to the roots of ill-health and to find out why disease arises at home or at work, how disease is encouraged by bad habits and improper knowledge of domestic hygiene, how much working conditions influence ill-health, and how the individual himself gives assistance to pathological enemies. After such enquiries have been completed it may be possible to see how investigations in individual and in general cases may be carried out and also how records may be kept and information stored for statistical reference. Here and there it may be found necessary to refer to other parts of this work, or indeed, to repeat what has already been stated, especially in Section III, but this is inevitable in view of the fact that social hygiology and establishment and maintenance of good health are measures that seek to apply the principles of hygiene and to make practical improvements in any situation in which improvement is needed.

Housing and Ill-Health

The weakly person in the good house may benefit by the environment, the strong person may weaken in the slum; people with the will to be well may overcome all their difficulties and make the environment better by their efforts; people who have no ideals about health and who represent the laggards in any race may clearly make bad conditions very much worse. At this point it is, however, necessary to think in terms not so much of the individual, but rather to examine the objective side of housing.

The Home.—Since the fundamental of most civilized races is the setting up and maintenance of a unit of living in which marriage of two individuals and subsequent procreation of children are the basis, the foundation of the home is a long-established custom, and although certain ideologies envisage the giving up of the home as a unit and the setting up of domestic units on a wider and more communal basis, it will be a long time before those in the British Isles, anyway, will choose to lose sight of the home as their domestic ideal.

Housing.—A successful home depends upon the occupants, especially those responsible for it—in most cases the man and

his wife. Allowing for that and leaving discussion of it for the moment, the building as a structure must command first consideration. Housing is a subject very much in the topical picture, and its importance cannot be over-estimated. Public health and building experts have collaborated for a long time with regard to the essentials of good housing, and although there are restrictions and difficulties intrinsic to the district and to the site of the house, including those of atmospheric pollution, nature of ground and so on, there has been evolved a satisfactory pattern in which all the hygienic essentials are allowed for, and in some cases more than allowed for, especially with regard to surrounding space. Dealing with the environment of the house first, and taking the example of the modern housing plans, the aim of the planner is to make the home of the worker as far away as is convenient (having regard to travelling, the time-factor, shopping, education and so on) from the factory, and to preserve the maximal supply of sunshine, fresh air, light and other natural elements. The subjects of sanitation, drainage, water supply, refuse disposal, heating, lighting and other important essentials of housing have already been discussed in Section III, and in the new housing schemes all these have, of course, been first in the thoughts of those responsible. The number of houses is determined by allowance of so much space per house; sometimes it is more convenient to build houses in blocks of 4, with satisfactory space all round; sometimes the single cottage-type house is to be preferred. Much depends upon the amenities of the situation, but it may be agreed that provided the house is up to modern standards, there is every reason to believe that apart from emergency breakdowns or accidental stoppages, the maintenance of such a house in a good state is possible so far as the average inhabitants are concerned, the main responsibility resting with the woman of the house. On the principles briefly enumerated above, there is no reason why health should not abound under such happy auspices, and always provided that the occupants of the house are prepared to collaborate intelligently in the hygienic upkeep of the house, nothing but good can come out of such a scheme.

Defects in Housing.—Unfortunately, the rosy picture painted above is to be seen only in small canvas. It has to be realized with complete dispassion that we have only just begun to remove the mass of the population from the environment of industry, and inevitably there will always remain on the old ground the fair proportion, despite all that can be done. The development of new housing schemes and the setting up of communities or even of new towns may well go on at the pace set by the economic situation. But the fact is that there are in existence today, despite all the slum eradication and the blanks made by

bombs, huge areas of property close to factory, foundry, shipyard or other workshop, great industrial towns with the workers' houses clustered round the spinning mill or weaving shed, conditions in which houses stand as they have stood for many years, struggling to preserve themselves against the ravages of time and wear and weather, with little or nothing to commend them to the idealist and much to be criticised by those who, unfortunately, have no option but to occupy them. This is the big problem in front of the hygiologist today. The best that can be hoped for is that intelligent application of patchwork measures—literally and metaphorically—may help to raise the standards of hygiene and to diminish the handicaps to good health.

The hygienist, be he medical officer of health, sanitary inspector, builder or other interested person, will search for and find the defects and try to remedy them; but when a pall of unhealthy smoke from a nearby chimney blots out the light and the ultra-violet rays, when drainage is old-fashioned, when sanitation is primitive, when water supply may be easily polluted and when the fabric of the house shelters rats, mice, cockroaches, bugs and various other parasites, there can be no underrating of the task in front of them. So it is that the district nurse, the health visitor or other hygiologist may be faced with the heavy task of making the best of a bad job, and very often the best can accomplish but little, and the job is extremely bad. Here all the handicaps of satisfactory living may be seen. Apart from the dangers referred to above, overcrowding, dirt in its most comprehensive sense, insanitary state of foodstuffs (especially milk) bad ventilation and many other retrograde elements combine to establish a set of conditions that is certainly not improved when the occupants have not the will or the power to make things better. The above, then, is the real problem today.

Other Factors Contributing to Ill-Health

Working Conditions.—Bad housing by itself is sufficient to form a background of ill-health that is dangerous enough, but working conditions may be such that these dangers are added to. Furthermore, it must not be forgotten that the worker may be perfectly well looked after at home and in a house which, despite many handicaps, comes up to acceptable standards, but all the good done by domestic efficiency may be undone by unsatisfactory hygienic conditions at the workshop. Now it must be remembered that Public Health and other Acts, far too numerous to mention, have made such restrictions on employers, that every possible effort is now made to bring up the standard of working conditions. But the stern facts remain

that for certain jobs, the specific nature of which need not be discussed, there is inevitably a health-menacing environment. This does not concern only fumes of chemicals, dust, dirt, dampness, heat and the many other items in the indictment; there is the mental aspect, as already mentioned in Chapter 1, and this is added to by noise, artificial light, monotony, fear, speed of production and the personal factor. Working conditions thus affect the individual fundamentally, and apart from all considerations of regulations, rules, precautions and restrictions, they may drain the worker's constitution until he finds that he is a casualty. Looking at the background of ill-health once more, we see that substantial portions are in many cases filled in by working conditions as described above.

Habits.—The less objective investigation centres on the individual once more, for it is necessary to know how the organism behaves towards its environment, good or bad though the latter may be. Enough has been said already to make it clear that a bad organism will not be bettered even by the best environment: his way of life is a perverse one. Hygienic law is known only to the few and it is doubtful whether the majority of people appreciate hygienic rules sufficiently to apply them to the full or to understand which have been broken when ill-health occurs. The average housewife must be expected to continue making mistakes; she has little or no time or even opportunity, once she is married and bringing up a family, for study of hygiene; such subjects should really be dealt with in the school curricula. The worker, male or female, is not always health-conscious and a certain section of the industrial population may not feel inclined to study the science of health. The result of all this ignorance of health matters is that people take risks. Habits known to be unhealthy are persevered with, sometimes against warning, but generally in ignorance. Good habits and bad habits have already been reviewed in Section III, and brief commentary is all that is necessary at this point. It may be remarked that life is not worth living if it is to be restricted at all points, but health routine is not a matter of restriction—it is in truth the correction of errors which were allowed to creep in and become established before the hygienists were aware of them, and the correction may be painful like any punishment by deprivation. Let us remember that the most ordinary breaches of health law give rise to the most extraordinary diseases, and all the warnings given are fully justified. Thus the hasty meal, the glass of stale milk, the closed window, the leaking water-closet, the choked drain, the lack of exercise, all may be factors in the home, in the office, in the factory and in fact, everywhere, in setting up disease or in intensifying disease already established and ultimately in leading on to the sickbed.

Health Promotion

Domestic Hygiene.—The housewife may take the above warnings to heart, but there is an additional responsibility to be shouldered, this being based on the fact that she is in most cases not only in charge of the household equipment and appliances, but she may be the mother of children and the latter are dependent on her for instruction regarding health. It is, therefore, the housewife who in 9 cases out of 10 has to tackle the hygiene of the home. It is almost an instinct among women that prompts them to carry out certain routine procedures in their housework,



FIG. 168.—PITHEAD BATHS. 1. COMING OFF SHIFT.

(By courtesy of Messrs. Hanovia Ltd., Slough.)

but a brief glance at any newspaper will furnish convincing evidence of the propaganda for health and cleanliness carried on by manufacturers of all kinds of household appliances and supplies. Thus the housewife has become aware of the need for open windows, for disinfectant precautions with regard to sanitary utensils, water-closets and similar domestic adjuncts, for protection of food, for limitation of dust and for cleanliness in every sense of the word. She is aware of the dangers of diphtheria and of tuberculosis and she knows that vitamin supply is essential for

hygienic welfare. In cases in which it is discovered that scabies, impetigo and many other similar diseases are prevalent, it is more or less certain that the mother concerned will not have any good grasp of the value of soap and water applied to every corner of the house and to the skin of the inhabitants. In all cases of domestic sources of ill-health, the standards of the woman in charge should be investigated.

Industrial Hygiene.—In the labour world, prevention of general ill-health and of diseases peculiar to the industry are not



FIG. 169.—PITHLAD BATHS. 2. AFTER THE SPRAY BATH.

(By courtesy of Messrs. Hanovia Ltd., Slough.)

the only aims and objects of the employers. Industrial hygiene is progressing rapidly towards maturity; it has grown up very rapidly, but it has developed power in its growth. The employer, therefore, thinks of health maintenance as much as of disease prevention and thus arrangements are commonly made to promote positive health by offering a service of clinics to the workers, electrical and light treatment, recreational facilities and instruction in hygiology. In many cases one or more doctors are

employed full time and the census of industrial nurses shows that several thousand women are actively engaged.

Pithead Baths.—As an example of what can be accomplished by imaginative planning and application of common-sense health principles, let us consider how much has been done for the coal-miner by provision of pithead baths and by the ancillary services of physiotherapy especially ultra-violet and infra-red therapy, and of specialist medical advice about rheumatic affections (fibrositis and similar ailments). In many collieries great researches have been going on for years in order to improve working conditions for miners, and although there is still much to be done it is encouraging to find that when the miner emerges from the cage at the end of his spell of work he can quickly be cleansed by hot baths and sprays, and by special methods subjected to light rays in suitable doses. The whole aspect of mining is altered by the fact that whereas the miner formerly went home black and grimy and had to disturb the whole routine of the domestic situation by having his bath in a tub in front of the kitchen fire, nowadays he leaves almost every vestige of the pit behind him, including his clothes, and having been thoroughly bathed, puts on his outdoor clothing and goes home to his meal like any ordinary worker. (See Figs. 169 and 170.)

Positive Health.—Although the above example is but one of many, it is illustrative of what is being done. It is inevitable that in certain occupations there is a risk of undermining resistance and of thus setting up disease, but here again in the space at our disposal we cannot do more than look at one or two examples.



FIG. 170.—PITHEAD BATHS. 3. HOME.

(By courtesy of Messrs. Hanovia Ltd., Slough.)

For instance the dangers of pulmonary infection and of rheumatic diseases are greater in laundries than elsewhere, but many modern appliances and procedures are in operation in order to make the worker free from such a menace. Again in certain occupations in which oil is used the oil tends to set up a form of dermatitis,



FIG. 171.—ARTIFICIAL SUNLIGHT FOR MINERS' INJURIES.

(By courtesy of Messrs. Hanovia Ltd., Slough, and Pictorial Press.)

but when a certain discipline is applied, ensuring that neutralizing measures are adopted at the very end of every shift, cases of dermatitis tend to diminish. Avoidance of dust in spinning mills and improved methods of ventilation have diminished the incidence of laryngitis and deeper pulmonary infections that were much commoner at one time than they are at the present day. Many more examples could be quoted of the ways in which improvements are being made in working conditions.

The tendency today to regard occupation in industry as something to be made as attractive as possible and as little damaging to health as can be brought about by health-consciousness, brings about a system of cooperation between employer and employee; between manager and operative and between the workers themselves; industrial health which is a community aim and in which community effort is established is always certain of success. The worker who conscientiously knows that his duty to himself, to

his family and to the community as well as to his employers is to maintain his health at its maximal efficiency must always regard his occupation as something to be retained and something to be productive of the greatest satisfaction to all concerned, including himself. It is obvious that perfect conditions cannot be found; in every occupation there is some snag—dust, fumes, bad smells, noise and the like—yet mentally and physically these drawbacks can be reduced to the utmost degree. The general trend today, therefore, is to show the worker how best to over-



FIG. 172.—REHABILITATION CENTRE.

(By courtesy of the Medical Director, Roffey Park Rehabilitation Centre.)

come the difficulties of his or her occupation and how to take full advantage of the health services available. The worker who has a chance to improve and maintain his physical state should not neglect his chances; even if it should mean that industrial psychology should be studied and applied, it may be advisable for certain types to apply their minds to this science. The whole idea of such ancillary services is that the general aspect of the occupation will be made more delectable; the job to be done has to be done, but the doing of it can become less irksome by the general atmosphere of the workshop and by the creation of the feeling among the workers that there is the smooth to match the rough and that there is a sincere desire prevalent in industry to save the worker from every possible hazard known to exist. Thus in making for positive health, those in industry recognize the dangers of the background of ill-health and seek in every way to eliminate it from the picture.

Study of the Individual

In the quest for the facts of ill-health, the investigator may have to become acquainted with the place of work, the home

and the circumstances of everyday life as they apply to the patient, but when all the information has been collected and sifted, it will be found that much concerns the personality of the man or woman who is sick. We have already referred to the personal index and other matters now to be discussed in greater detail; these can never be lost sight of in any assessment of disease.

Personal Index and Prognosis.—Some more details may be given of the methods of reaching a prognosis in any given case; in the previous chapter the general principles were laid down. The most meticulous examination of the patient must be made from the point of view of his likes and dislikes, his zest for work, his hobbies, his recreations, his amusements. Piece by piece this jig-saw of a human being must be fitted together. The organism in all its reactions to its varying environment must be envisaged and then the personal index allocated. The investigator may have to spend hours in collecting the data essential to full understanding and the making of visits to the home, to the factory or to other resorts may be demanded; in some cases the evidence of those who are in close touch with the patient—industrial nurse, companions at work, members of family, district nurse, health visitor or neighbour—may be acceptable, although in ideal circumstances the true personal index should be arrived at by one person who has investigated the case in its every aspect.

Investigation.—Very little need be said about this, as in several places the subject has been already discussed. Here, however, some attempt may be made to consolidate the findings. The ordinary physical examination of the patient will disclose abnormalities visible and invisible, and needless to say all the machinery of clinical modern investigation will have to be employed to the full. In the history of the case, not only the family and personal history are to be noted, but the facts of the patient's career, including unusual physical and psychological experiences. Indeed, so far as the personal reactions of body and mind are concerned, the ideal is to obtain a complete record. But this is not all. The case cannot be complete unless the facts of housing, place of work and all the elements of the variable environment are studied one by one. Is the house insanitary or cramped or dingy or in any respect restrictive of full enjoyment of life? This is a matter for very close questioning and examination; the investigator must see for himself or herself what is the state of the actual environment. The same applies to the workshop; it is at least essential to have reliable information as to the numbers employed in the building, the conditions of work, the type of job and the whole atmosphere of the place. It is not always possible to achieve such complete success in the search for information, but again if there be difficulty in examination,

the trustworthy evidence must be obtained of the industrial nurse or of the workmate. Admittedly, the above is the policy of perfection and many elements must be against a full survey; in the complete picture which is sought, however, no detail need be too small.

Records.—A word may be said here about records and the preservation of them. There is nothing that can beat the written word so far as establishment of historical facts is concerned and therefore records of historical value should be made. In taking notes the nurse making the investigation must learn to discriminate between the grain and the chaff; a good plan is to record in rough notes every observation made and every fact ascertained, then to write up the case as a fair copy with any redundant matter left out. Any histories given by relatives, associates or trained observers should be included, but it is always advisable to state the name of the person giving any information which has not been obtained first-hand. As time goes on progress notes will be needed and thus the whole authentic medical or hygienic history of the individual can be maintained and brought up to date. The huge amount of work involved in this admittedly ideal kind of record, may be well worth while; so far records in general practice have been more or less sketchy productions, and under the National Health Insurance were confined to the bare facts of the purely medical part of the patient's life; under the National Health Service Act it is not yet clear how much time is to be available for the keeping of satisfactory records. All that can be said at the moment is that unless full investigation is made and unless full records are available, social medicine will not be given its full scope. It may thus happen in the not too distant future that the personal *dossier* will start with birth and end with death and will contain complete records of the idiosyncrasies of the person concerned, his likes and dislikes, his dietetic peculiarities, the type of bed he sleeps in, the forms of recreation he may have chosen, his reactions to rain, sun, snow or the sea, his choice of clothing, his reactions to humanity in general, his sex inclinations, his religion, his culture, his urges and instincts—in fact the list might well go on *ad infinitum*.

Among the valuable data of the personal *dossier* are those of the hospital in which the individual may have been treated. Most hospitals keep very accurate and reliable records, but these rarely if ever accompany the patient when he returns home. It is true that most hospitals help in every way by giving free access to records when the doctor concerned may want to consult them, but a much better way would be to add to the personal file the salient points of hospital observation and treatment and thus keep the record complete.

Similarly points observed by health visitors or by those visiting

the home for hygiological purposes should not be lost; the record should be available to all who have authority to add to it. This is the only way of compiling any worth-while record.

Conclusion.—A great deal of what has been said above may amount to anticipation of events, but in the task which was set—the painting of the background of ill-health—the real and the ideal must be compared so that some conception may be formed of the great possibilities of social medicine. It must not be forgotten that since social conditions are admittedly bad, it may require a revolution to bring about permanent betterment and the inauguration of modern ideas in health. What may appear to be Utopian and impossible today may not be so tomorrow; since great transitions must be envisaged, it is not impossible that a large mass of the personnel of medicine may be transferred from the curative to the preventive side of medicine, and new ideologies may regard lengthy case-taking and the obtaining of information as of greater importance than, say, operative surgery or chemotherapy today. Time alone will tell how medicine will pursue its course.

CHAPTER 3

PUBLIC HEALTH SERVICES

ORGANIZATION. THE MAIN PLAN. MINISTRY OF HEALTH. ASSOCIATED GOVERNMENT DEPARTMENTS. LOCAL GOVERNMENT. HEALTH OF THE COMMUNITY. COMMUNITY HYGIENE. WORK OF LOCAL AUTHORITY. THE MEDICAL OFFICER OF HEALTH. NATIONAL HEALTH SERVICE.

A SUBSTANTIAL portion of the present Section must be devoted to the study of the Public Health Services, including chapters on Maternity and Child Welfare, Health of the School Child, Tuberculosis, Venereal Diseases and Mental Deficiency. As a preliminary, however, a brief review of the public health services as a whole must be made, as well as of the National Health Service and of various other activities associated with health matters.

Organization

The full story of the development of public health administration cannot be told in a few lines; public health has already a long history and all of it is important. In the present chapter the aim is to give to the nurse the main points in the Public Health Service as it is in existence today and to refer to the salient features of its development. It will no doubt be borne in mind, however, that the present era is one of almost revolutionary changes in the medical world.

The Main Plan.—The central administration of all public health matters and of many others rests in Parliament, which has created a Ministry of Health, with an appointed Minister who, from his office in London, directs all work concerning the health of the people. Decentralization is the rule, however; thus a great amount of the management of the public health is in the hands of the local authorities i.e. the various bodies elected by the voters to carry on the local government of counties, towns, urban districts, rural districts and so on.

Ministry of Health.—By Act of Parliament (1918) the Ministry of Health was created for England and Wales (Scotland has a separate department which for all practical purposes is on the pattern of the Ministry of Health; Wales has a Board of

Health presided over by the Minister: in this section reference is made to Scotland or to Wales only when measures apply specifically to these countries). This Act absorbed all the powers and duties of the old Local Government Board, the Registrar-General, the Insurance Commission, Board of Education, and the work of the Privy Council so far as the Midwives Acts were concerned. It has been laid down that the objects are "to bring every advance in medical science, every measure calculated to maintain health and to prevent disease, to the service of the people, and to make health the birthright of every inhabitant of this country." As admirably summed up by MacNalty, "the Ministry has consolidated and developed the health services; it has done great things in the field of international health; it has reduced the mortality and incidence of many diseases, including diphtheria, by encouraging immunization; studied the problems of nutrition; fostered orthopaedic treatment, the early diagnosis and treatment of cancer, the treatment of the rheumatic diseases; and has seen its reward in improved national health and the progressive reduction of the death rate." Such achievements need not cause any surprise when it is remembered that among the duties of the Minister are those of prevention and cure of disease, organization of research work, care of those mentally and physically afflicted, education and training of men and women for service in various public health branches of work, preparing statistical reports, care of the blind, the infant, the pregnant and nursing woman, the pre-school child, the poor and various other infirm persons, administration of medical benefits and public vaccination.

Associated Government Departments.—There are many other Government departments associated with the Ministry of Health, and the names of these constantly recur in the application of public health in its widest sense. Thus the great and active work of the Education Ministry must be kept in mind, as well as that of the Ministry of National Insurance, Ministry of Labour and National Service, Ministry of Town and Country Planning, the Board of Control, and all the other Boards familiar to nurses as pertaining to nursing, trade, midwives, doctors and medical students and dentists. Many of these collateral central departments are dependent upon the work of the Ministry of Health and vice versa.

Local Government.—As mentioned above, administration of health services is decentralized, the country being split up into areas for the purpose. The Local Authorities are referred to as principal authorities when they are those of counties and county boroughs and as subordinate authorities when they rest in municipal boroughs and in urban districts and rural districts. As a rule the County Councils exercise supervision and are the

directing factor, but plans vary according to circumstances. It is indeed not always easy to follow the routine. However, in the main it may be said that for public services such as sanitation in all its branches the County Council is the supervising authority. On the executive side we find that with regard to tuberculosis and venereal diseases, mental deficiency, powers under the Midwives Acts and various other minor items, the County Council is also the authority concerned; in some cases the County Council may exercise its powers with regard to maternity and child welfare and to the supervision of the supply and storage of food and drugs. As might be imagined the County Borough Councils act in much the same way but quite independently of the County Councils. As we descend the scale we find that so far as the three remaining councils are concerned their powers are limited in proportion to their application and needs. For these reasons it may happen for instance that in certain places the County Council and the Rural District Council have both of them different responsibilities and this sometimes causes difficulty.

In conclusion it may be remarked also that although some Acts referring to health may have general application, others refer to one particular area and again a certain Act need not be adopted by the council concerned unless it is regarded as one which can apply. It is nowadays the usual custom to frame the main Act to deal with general principles only, and many associated regulations may be framed, these going into much detail. In certain areas, too, peculiar circumstances may make it essential to obtain what is known as a Provisional Order, this regulating certain specific activities within the area concerned. And over and above all these legislative measures, there are the many byelaws, which are made by the authority responsible and on account of conditions regarding which only the local government body can properly come to a decision with regard to regulation. In many cases by-laws have been framed for the purpose of regulating activities with regard to diverse subjects such as mortuaries, cemeteries, nursing homes, offensive trades, baths and wash-houses, slaughter houses, dwelling places, smoke, public lavatories and the like.

Health of the Community

With all the powers available and with the many councils and committees to apply such powers, there is surely a sound basis for hope that the aims and objects of the Minister of Health will be realized and reached. The sanguine belief that ere long every single person will be able to give of his best, according to his grade of intelligence or skill, and that the human race will continue to improve in quality as each generation is scrutinized

and the weaklings or subnormal specimens specially dealt with by all the remedies of the modern age, is not indeed a matter of wishful thinking. By raising the general standard of mental and physical efficiency the stock must be bettered.

Communal efforts to improve health in a general way have been on the increase, despite the disturbing incidence of two World Wars. Health-consciousness, already referred to in regard to the individual at work or in the home, must also be considered as applying to the mass. When the members of a community become convinced that a certain course of action is for the general good it is more than likely that they will unite to foster such belief and will take active steps to ensure that the hygienic benefits associated with it are obtained. Much of the public health work demands response and cooperation by those to whom it applies; the experience of today is that the public responds enthusiastically towards any measure which appeals to its common sense. As examples let us remember that child welfare schemes have been so well supported that they have now become established firmly, the clinic being a forum for exchange of views and experiences; let us appreciate the fact that in the schools the children are told what health means and are encouraged to have physical training; let us review all the interest in athletics and sport taken by adults of both sexes, the desire for fitness and healthy living, for open-air life and for exercise. The community eagerly desires that the children should be well nourished and well clothed and housed, therefore it has welcomed the special rationing, the daily glass of milk, the school dinner.

Community Hygiene.—This term is sometimes used in place of the term, public health, although the latter is more properly applied to the work of the Medical Officer of Health. Many of the main divisions of community hygiene have been mentioned already and nurses are generally familiar with the principles of school hygiene, mental hygiene and industrial hygiene and with the general or social hygiene which seeks to better all conditions of life and to replace the old and bad by the new and good. The pattern set by what is comprehensively termed State Medicine applies to the whole nation and each and every district or area may adopt or alter that pattern as necessary. A very important part of community hygiene is Sanitary Science, which under the modern efficient sanitary inspector may be applied with certainty of success to all problems associated with disposal of refuse, sewage disposal, safety of water supply, prevention of nuisances and many other potential nuclei of raging diseases.

Work of Local Authority.—The community is served by the appropriate local authority and the health department is presided over by the Medical Officer of Health, generally referred to as the M.O.H. Under the latter are various deputies and assistants,

some dealing with child welfare, some with tuberculosis, some with venereal disease and so on; the non-medically qualified may amount to a considerable company of sanitary inspectors, health visitors, public health nurses, food inspectors, and even rat catchers. The public health department is more or less guided by the Public Health Act of 1936, which is a revised and augmented version of some 28 Acts now repealed. It is, so to speak, the family bible of the Medical Officer of Health. This Act consists of 12 parts and deals with sanitation and buildings, nuisances and offensive trades, water supply, prevention, notification and treatment of disease, hospitals and nursing homes, notification of births, maternity and child welfare and child life protection, baths, wash-houses and bathing places, common lodging houses, canal boats, miscellaneous items and general provisions. It will be obvious to all nurses that the M.O.H. has little chance of suffering from boredom. In the chapters which follow, some of the subjects are dealt with specially but in the present chapter only the work of the M.O.H. need be discussed, and a few general remarks passed on the National Health Service.

The Medical Officer of Health.—This officer, male or female, must possess in addition to the usual medical degrees a Diploma in Public Health officially approved. Many regulations are laid down governing the appointment, which comes under Part XII of the Act. As a rule the M.O.H. is the adviser on all health matters affecting the community, and he is charged with the responsibility of maintaining a good standard of health in the area under his control. He directs all the health services of his area, and thus is the person responsible for the running of the health services of the district (except the National Health Service), these including the control of infectious disease, the maternity and child welfare services, medical inspection of schools, and care of the blind and the poor. But in addition to that the M.O.H. is expected to give his professional advice so far as food and water are concerned, and he is always to be consulted with regard to housing schemes and planning of residential areas. He may also be required to arrange for a school dental service. He is expected to make an annual report covering all his activities and this amounts to a medical review of the previous 12 months.

National Health Service.—It is not easy to envisage what changes if any will take place in the work of the Medical Officer of Health as time goes on. At the time of writing the National Health Services Act has just begun its operation and various adjustments have had to be made and are being made in the services available. Certain services remain outside the Act and therefore continue as before; others are absorbed into the Act. The main provisions of the National Health Service Act are

summarized and discussed in Chapter 9, and for this reason little is said at this stage about this important measure. Many of the voluntary organizations have already disappeared and as time goes on presumably all kinds of aid—personal, monetary, and so on—will come under the Minister, and this is as it should be, for under the provisions of the National Insurance Act, the amount of money paid by the citizen should be quite sufficient to make him independent of any voluntary organization; formerly it was one of the most deplorable conditions of human existence that to a great extent the regaining and maintenance of health were dependent upon charity.

In this brief review of the public health services, it will have been evident that very careful consideration has had to be given to all the statements made, for since the time is one of transition, it is not always possible to say how conditions of service may alter. There is this to be said, however: the medical force remains the same and the number of the population for all practical purposes remains the same, therefore medical service to be efficient must use its medical force to the best advantage. Later on when the many new situations created by the National Health Service Act are under discussion, it will be possible to make some assessment of the amount of changes made in public health administration, especially so far as the local authority is concerned. Meanwhile, it may be said that there appears to be little change in the effects produced. Administration may have been remodelled but the executive work goes on as formerly, but with added improvements and benefits.

CHAPTER 4

MATERNITY AND CHILD WELFARE

HISTORICAL DATA. MATERNAL MORTALITY. MATERNAL MORBIDITY. INFANT MORTALITY. MATERNITY AND CHILD WELFARE SCHEMES: AIMS AND OBJECTS. BASIS OF MATERNITY AND CHILD WELFARE. INSTITUTIONAL SERVICE. THE CENTRE. RESIDENTIAL CENTRES. SERVICES IN THE HOME. CONFINEMENTS. MIDWIVES. PREVENTIVE WORK OF WELFARE CENTRES. CARE OF THE PREGNANT WOMAN. DEATH OF THE CHILD IN THE ANTENATAL PERIOD. PREVENTION OF INFANT MORTALITY. CARE OF CHILDREN UP TO AGE OF 5. CHILD LIFE PROTECTION. CRUELTY TO CHILDREN. EMPLOYMENT OF CHILDREN. ADOPTION. THE FOSTER-CHILD.

THE subject of maternity and child welfare is historically important for until the various schemes were established the whole aspect of child-birth and motherhood was one of great danger, the deaths among mothers from various causes being very high and the infantile mortality almost a menace to racial survival. Those who have lived only during the era in which maternity and child welfare has been in operation cannot fully appreciate how great are the changes that have been brought about. The widespread services available at maternity and child welfare clinics and in other places based on such clinics now ensures for every expectant mother expert supervision during pregnancy, medical and midwifery service at the confinement, advice in the postnatal period and guidance with regard to children up to the age of 5. It will repay all nurses to make a very close study of maternity and child welfare, and therefore considerable space is allocated in this chapter to the subject.

Historical Data

Child-birth under natural conditions is akin presumably to the parturition associated with animals, and it is generally agreed that the so-called civilization of Man has brought with it all the well-known dangers. As proof of this, maternal mortality and morbidity, and deaths of newly born infants clearly increased as time went on and the statistics speak for themselves.

Maternal Mortality.—Taking England and Wales alone, and leaving aside the figures for Scotland (which have always been considerably higher), the deaths among mothers within the past 40 years have shown a marked decrease. At the beginning of World War I, the deaths per 1,000 live births were about 4, and the figures varied during the subsequent 20 years, when it might be said that maternity and child welfare service was getting into its stride, and a steady decline was to be noted from 1935 onwards, the present-day figures being about 1.50. This is sufficient to show what has been accomplished. A more recent method of recording statistics is that which takes into account not only the live births but also the still births. There is every hope that the death rate among parturient mothers will be lowered still further. Many researches have been carried out and it is known, for instance, that antenatal care has a marked effect on limitation of maternal mortality in the case of unmarried mothers, who generally try to conceal their state for as long as possible, and in any case the pregnancy is the first as a rule. Age has also some considerable influence on the maternal mortality, it being found that as the age of the mother increases so does the chance of death in childbed increase.

Effect of Hygienic Conditions.—It is a strange thing, but well confirmed by experience that provided she is of good physique and of normal general health the working mother is not more disturbed by her confinement than if she were a person leading a life of luxury. In fact, it has always been the experience of doctors working in industrial areas that the mother who may have been working at her loom or spinning frame up to the last day of pregnancy is a good subject so far as parturition is concerned, and undergoes all her ordeals with the minimum of difficulty; furthermore, residence in poor class areas and even in the slums did not appear to have any effect on the maternal mortality. During the course of World War II, many experiments were made with regard to the diet of expectant mothers in Great Britain, America, Canada and elsewhere, and statistics clearly show that a diet with ample vitamin content and with properly balanced proteins, fats, carbohydrates and salts results in safe motherhood, whereas lack of these essentials causes miscarriage, prematurity and higher incidence of death in childbed. Heavy work, especially lifting of weighty clothes baskets and the like, as already stated in Section XII, is bad for the pregnant woman, and even when a working woman has a fairly light job she should not go back to it too soon after the child is born.

Maternal Morbidity.—Always considered with maternal mortality, the subject of maternal morbidity is one which also increases the dangers of child-birth and for which much has been done. One of the commonest causes of maternal morbidity—

puerperal fever—was at one time very prevalent, but modern therapeutic measures, especially the use of sulphonamides and to a certain extent of penicillin, have reduced the incidence very much indeed. Any systemic disease is likely to have its effect not only at child-birth but during pregnancy and the puerperium, and as a parallel, child-bearing may increase the existing disability, therefore great care should be taken in dealing with pregnant women who are abnormal in this way. Injury must never be ruled out of the picture. It is unfortunate that proper statistics cannot be obtained, but the medical profession is alive to all the dangers of maternal morbidity and the routine of examination and supervision is similar to that applying to the prevention of maternal mortality.

Infant Mortality.—The experience of the last 50 years has shown that the infant mortality (deaths of children under 1 year) has declined with a regularity which could give no better proof of the success of the effort made to save infant life. In 1900 the infant mortality rate was 154; in 1945 it was 46. The causes of this dramatic reduction will be apparent as the story of child welfare is continued in the following pages. Nurses may be interested in the method of calculating infant death rate: it is arrived at by comparing the number of deaths of infants in any one year with the number of live births occurring in the same year; there is a certain number of infant deaths per 1,000 live births and the figures obtained are taken to indicate the infant death rate or mortality.

Maternity and Child Welfare Schemes : Aims and Objects

From what has been said in the opening pages of this chapter, there was and is substantial reason for the establishment of the maternity and child welfare scheme. It is now necessary to examine the scheme carefully and to learn what it offers and what it accomplishes; full appreciation of this work will be helpful to nurses who in the course of their professional career may find that in many and diverse ways they may be involved in its branches.

Basis of Maternity and Child Welfare.—In the Public Health Act of 1936, Part VII, regulations are laid down with regard to notification of births, to maternity and child welfare and to child life protection. As already stated, these regulations are more or less consolidated from various antecedent Acts, and, therefore, if Part VII be studied carefully it will acquaint the nurse with all the fundamentals of the service. We shall now examine these in some detail. In the first place, the persons to

contraceptive measures, the women who attend being those selected by various medical and nursing workers, and the reason for selection being that it is considered that further pregnancies would menace the woman's health. In many cases a fourth clinic, in which gynaecological advice is given by specialists, is established, closely coordinated as it may be with the other 3 clinics. All these clinics keep careful records and the information should be freely available from one to the other. When the scope of the centre is enlarged it may deal with children up to 5 years of age and with school-children, clinics for the latter being established with their own special staff. In many centres facilities exist for examination only of those with dental troubles, venereal disease and other conditions, the treatment being carried out at other appropriate places—special clinics, hospitals and so on. The personnel associated with the centre may be of various types—doctors, nurses, midwives, physiotherapists, public assistance officers, voluntary social workers, health visitors, dental nurses, school nurses, clerks and stenographers.

Residential Centres.—Apart from the arrangements made, as mentioned above, for the housing in welfare centres of infants who may have to be supervised for a day or two, there are many other inpatient services in association with maternity and child welfare. For instance, it is obvious that most maternity hospitals and departments must be closely linked with the centres. As a rule the local authority provides for the convalescent period after child-birth and many convalescent homes have been established, these being available for the mother and infant. As a result also of the enlightened knowledge with regard to infection, most up-to-date hospitals of any size have wards to which patients with puerperal sepsis are transferred, wards for dealing early with orthopaedic problems in infants, wards or cubicles in which children who by some chance (very small nowadays) have developed ophthalmia neonatorum or other infective disease, and wards to which women with active venereal disease may be transferred. The general organization of these may be altered under the National Health Service Act, but the need remains, and no doubt the supply of accommodation will be bettered.

Services in the Home

We now turn to the second main branch of maternity and child welfare, viz., services in the home. It is true that the latter does not amount to the great organization represented by the welfare centre, but its function and results are equally important. Needless to add, there is the strongest liaison between the two branches.

Confinements.—Human beings, and especially the females, are very conservative with regard to adoption of new ideas, and, therefore, there is still a strong instinct among mothers that their babies should be born at home. There is no real objection to this, despite the many arguments that may be put forward to support the fully equipped modern maternity hospital. Furthermore, as emphasized more than once already in this work, there is no proof that even in the most squalid areas and under the most revolting domestic conditions maternal mortality is increased; the contrary seems to be the case, as statistics of rich and poor demonstrate. A woman who wants to be confined in her own home may have the help of the welfare centre, the officials of which may look after her as usual in the antenatal phase and see that she is provided with a lavette and other equipment, that the house is more or less made suitable for the birth and that extra help is brought into the house during the puerperium. A woman may choose her own doctor and midwife, or on the other hand she may let the welfare centre arrange for the delivery of her child. The importance of all this is that domestic midwifery can be kept closely in touch with the welfare centre and all the services may be coordinated to suit conditions. There is no need to discuss the duties of any private doctor engaged for the confinement, except that it should be mentioned that in an emergency the doctor may expect to get all assistance from the welfare centre in his district and also specialist and hospital services in cases of urgent need for such help. It will be clear to the nurse that the maternity and child welfare scheme performs its service adequately in these domiciliary cases.

Midwives.—Although the term, midwife, is one of mediaeval times, it is still used to designate a woman who carries out certain duties at child-birth. Indeed the status of midwife has been raised to a very high level within the present century. In the days of Dickens and Betsy Prig and Sarah Gamp, midwifery was conducted in very reprehensible manner, and the stigma attached to the word, midwife, was great. Various handywives and so-called maternity nurses did most of the maternity work in the nineteenth century; some may have been quite skilful but they lacked the science of their profession. A growing realization of the dangers of unskilled attention together with a desire to improve in every way the circumstances of child-birth caused the establishment of the Central Midwives Board, a committee of representative men and women, and thus there began a system of education, supervision and discipline which set the profession of midwife on its feet. Various Acts of Parliament, some of which are referred to below, subsequently allowed regulations to be drawn up and now the midwife is assured of a proper status and the widespread recognition she now enjoys. The work done by the

midwife is governed by the Midwives Acts, but these are in turn applied through the medium of the Central Midwives Board which administers the Acts and makes regulations. There is a separate Board for Scotland but for convenience the Board for England and Wales is referred to here. Actually there have been 4 Midwives Acts—those of 1902, 1918, 1926 and 1936, the last for all practical purposes being the effective Act today. Certain points in this Act are noteworthy.

Midwives Act, 1936.—This is still the Act in operation and it does not appear to have been disturbed in any way by the National Health Service Act of 1948. One of the main clauses states that local authorities will arrange for a salaried midwifery service or alternatively to finance other available voluntary services for the work to be done. By this Act the midwife is employed full-time at a salary, is qualified for a pension on retiral and in her work has all the assistance of the local public health department. If need be, the midwife may attend at a confinement at which a doctor is in charge, acting then as a maternity nurse. The service available to the ordinary citizen is great because it ensures that the pregnant woman can have at her confinement a person who is properly trained and also governed by strict rules, ensuring that she does her work efficiently. One of the rules governing the practising midwife is that in any emergency she must call in a doctor, one of a list available to the local authority, which undertakes to pay the fees. In all these matters concerning the Act, the Central Midwives Board is the central authority, advising as it does the local authority. The main function of the C.M.B. so far as the practising midwife is concerned is to frame regulations for education and to grant certificates of proficiency in midwifery to those who have passed approved examinations. Secondly the C.M.B. keeps a midwives' roll and has power to add names to it, but—more important to midwives—to remove names also. To sum up, we may say that the C.M.B. maintains educational standards, regulates conduct and supervises practice of all who come within its authority. All rules must have the approval of the Minister of Health. From time to time midwives may have to attend refresher courses, these generally being arranged by the local authority. The latter also fix the fees to be paid for maternity services and collect them. Despite all the above examples of central direction, local powers exist, and the appropriate authority must keep a watchful eye over the midwives of their own area; any midwife alleged to be careless or not sufficiently meticulous about disinfection, for instance, may be suspended and her misconduct or other delinquency reported to the Board, which may take disciplinary action. Midwives must keep a register of the cases they have attended and this register may be inspected by the local authority, as well as instruments, equipment or any

other appliances used by midwives. Lastly, as a method of saving the pregnant woman from unqualified practice and giving further proof of the way in which the qualified midwife is now protected, it is laid down in the Act that no unqualified person may assist at a birth unless that person is under the direct supervision of someone medically qualified. More than that, it is illegal for anyone to style herself as "midwife" when she is not in possession of the certificate issued by the C.M.B. As might be expected there are exceptions to these rules, these applying to the case of the medical student and the student-midwife, both of whom are strictly controlled in their actions and who have to report at length on their activities in each case to the qualified person to whom they are responsible.

Emergencies.—It has been stated that in certain emergency cases the midwife who is engaged to take full charge of the case is bound to call in a doctor who has previously agreed to be on the list of those available in this type of emergency. The C.M.B. has drawn up a list of the conditions in which it would be the duty of the midwife to demand such help, so that there is no doubt about what has to be done; the list is comprehensive, consisting of more than 30 conditions. Some of the latter refer to a moribund state or one of actual death occurring at any stage of pregnancy, labour or the puerperium; to severe degree of hyperemesis; to malpresentation or abnormal presentation; to pyrexial conditions in the puerperium. With regard to the last, the rules clearly state that when a temperature of 100.4° F. lasts for 24 hours or recurs in that period, or when on 3 successive days the temperature exceeds 99.4° F., a doctor must be summoned. As already mentioned in this work, there is also a rule which directs the midwife to report to the doctor when the child's eyes are in the slightest way inflamed or giving rise to a discharge. The midwife must also report to the local authority without delay when it has been necessary to call in a doctor, when her patient has died, when she has laid out a dead body (so far as she is concerned it must have been her own patient), when a patient has given birth to a dead child in the absence of the doctor, when she has been exposed to any infective process or disease and when it is considered necessary to stop breast feeding and begin bottle feeding.

Preventive Work of Welfare Centres

It has already been shown that maternal mortality and morbidity among other things were responsible for setting minds to work to devise welfare schemes, and it is now appropriate that some facts about the preventive work of the centres should be stated. After all, these centres do not exist so much for the treat-

ment of disease or abnormality as for the maintenance of good health and the establishment of conditions that will prevent successful invasion by pathological organisms. In the paragraphs which follow, the main items of preventive welfare are discussed as they apply to the mother, to the infant and to the child up to the age of 5.

Care of the Pregnant Woman.—Some of the measures applied to the diseases of pregnancy have already been considered in Section XII; in such cases, only the statistical or public health factors will require to be discussed. The object is to reduce to the minimum the chances of disease or death during pregnancy, labour or the puerperium; the early examinations and the periodical reviews of the case prompt the doctor to apply remedies, and these reviews should be continued all the way through until indeed the mother is back to her normal routine. As already mentioned the two great menacing diseases of pregnancy are toxæmia and puerperal fever; these are fully discussed in Section XII, but a few figures may be of interest. First it is well to realize that toxæmia of pregnancy, unless carefully and courageously dealt with, will end fatally; it accounts for over 16 per cent of deaths associated with child-bearing. In all welfare centres the blood pressure is estimated early in every case; urine is examined also for albumin, therefore there is every chance of earliest recognition of the abnormality, and proper treatment, at home or in the hospital, can be arranged for at once. It is a startling fact that three-quarters of the women who die of eclampsia could have been saved had early treatment been instituted. Second in importance to toxæmia is puerperal fever which is caused by a pathogenic organism (see Section XII) and which is responsible still for one-third of the deaths occurring in childbed. It has been proved by research that out of every 100 women dying of septic fever as above, 59 could have been saved by preventive measures, e.g. treatment of dental caries, gonorrhoea, boils and other foci. Malpresentation or other abnormality of the foetus—indeed any foetal or maternal condition that might cause laceration of the external genitalia and neighbouring tissues—when early recognized can at least be noted and every possible measure adopted in order to limit damage during and after birth. The preventive measures to be adopted by the attendants, including the midwife, have already been discussed; apart from all the already mentioned precautions to keep the germs away from the patient there are certain measures, adopted in hospitals, which also require to be noted. These are based on the more recent discoveries that dust in a ward may be a fertile source of infective disease; cross-infection is therefore caused when the smallest particles of dust—those for instance which are given off from fine cotton dressings—are blown from cabinets, utensils,

equipment of the ward and so on. The present-day methods of using spindle oil on dusters or by spraying the floor and ward furniture with spindle oil and carefully mopping in each case, or of vacuum cleaning of floors and walls are in widespread use. Experiments have also been made with bactericidal solutions in fine vapour, the latter being dispersed in the room; these agents are known as aerosols. A further precaution taken in many maternity hospitals is the examination of nurses' and midwives' throats for evidence of the *Streptococcus pyogenes*. The prudent but somewhat extreme suggestion has been made that all intending to become midwives should be submitted to a thorough examination of the nose and throat, and that when swabs taken show the candidate to be harbouring the streptococci associated with chronic tonsillitis, pharyngitis or any inflammation of any of the sinuses, she should be informed frankly of the dangers of the condition and told of the difficulties which might lie ahead if she were to become a midwife. It might be the most practical and easiest way out of the situation by adopting the policy of the positive swab disqualifying the candidate, but in these days of great shortage, so many otherwise satisfactory women might by this test be debarred that the service would be further menaced by greater lack of midwives. The treatment of puerperal fever has already been dealt with in Section XII, therefore nothing further may be said here, except that according to regulations the doctor in charge has to notify any occurrence, and when he does so he may ask for specialist opinion, bacteriological tests, permission to send the patient to hospital or for the services of a trained nurse at the patient's home.

Abortion.—This subject has also been discussed in Section XII, chiefly from the clinical point of view. Regarded as one of the main factors menacing the life of the pregnant woman, abortion is considered among the dangers of pregnancy because of the crime commonly associated with it. So far as prevention of abortion is concerned (i.e. in ordinary cases of threatened abortion or of women whose history in respect of abortion is bad) this may well be part of the routine of the welfare clinic, the obstetrical or gynaecological specialist giving expert advice. But the great menace to maternal health is criminal abortion, which is abortion deliberately brought about by using or the giving of drugs, or by passing instruments into the uterus and dislodging the foetus. When it is considered that over 50,000 criminal abortions occur in Great Britain every year, i.e. about 140 per day, and when it is realized that of every 100 deaths associated with pregnancy, 13 are the result of abortion, it will be clear why so much alarm exists about this practice. Most of the abortionists are low-class unqualified women, who take grave risks in every way, and their lack of skill is reflected in the high percentage of

septic cases which result from their interference—nearly three-quarters of all cases of abortion which end fatally are caused by pyogenic bacteria. Furthermore it will be realized that since abortionists cause sepsis, and since the latter is of such danger, a survey of abortion as a whole must show that criminal methods are responsible for nearly all the fatal cases. This is a sorry record, and in one way the sign of the times. Criminal abortion has always been difficult to investigate, and because it is a desperate measure with much to promise when relief is given, women will submit to it with their minds in a state of panic. Undoubtedly all the circumstances—the concealment, the difficulties of the secret fight against sequelae, the fear of being found out and of having to disclose the name of the abortionist—are ideal for the success of a bacterial invasion. With regard to the work to be done by the welfare centre, the main efforts must be made to save the patient's life in the first place and to prevent chronic inflammation of the pelvic contents—a condition far too common and one which is wearisome to all who have to suffer its discomforts and pains sometimes for years. The tracing of the criminal is entirely a police matter, but all who are interested in the battle against criminal abortion must seek to give any assistance they can towards the elimination of the practice.

Food Factors in Pregnancy.—In World War II it was widely recognized, especially in Great Britain, America and Canada, that the essentials of successful maternity were to a large extent ample provision of calories and vitamins. In other words, in a rationed population, pregnant women become privileged persons so far as certain commodities are concerned. Much of this philosophy remains in the post-war era. The nutrition of the expectant mother is one of the main responsibilities of any welfare clinic, and in the antenatal section the intake is carefully checked up. As is well known, the pregnant woman may be supplied with additional quantities of milk, and in certain cases arrangements are made for regular supplies of eggs, fresh vegetables and fruit; at all welfare centres, halibut oil, cod-liver oil, malt and synthetic vitamins in liquid and capsular form are mostly available, and that they are welcomed by most pregnant women is a proof of their efficiency. It is agreed that physique is not a matter of the tablet, however, and heredity and upbringing, as always, are the determining factors in the health of the pregnant woman. Nevertheless, it has to be kept in mind also that in domestic conditions associated with industrial areas (see Chapter 2) the potentially strong woman may be temporarily weakened by hard work, none too rich food, lack of sunlight and various other factors already described. An extra ration of this or that, a regular supply of vitamin, a daily dose of mineral salts and observance of the rules laid down by the clinic with regard to rest, may make

all the difference between difficult and easy pregnancy and subsequent child-birth. Civilization has much to answer for and urban dwellers are not only to be found among the abnormal in pregnancy and child-birth; some apparently robust women, who have lived in the country all their lives, suffer from diseases exactly similar to those to be noted in the towns. Nevertheless, research and statistics emphasize that the open-air, natural life is better for child-bearing women than the artificial life of the cities.

Hospital Provision for Maternity.—Most districts have by long experience come to some assessment of their needs with regard to hospital accommodation for maternity cases. The ideal number in any given area is governed by various considerations. For instance, the type and standard of the majority of the inhabitants must be a major consideration, for here the fundamental point is whether it is better for a certain type of ordinary case to be dealt with in hospital or at home; again physique and general standard of health may cause an increase of the number of those who because of some abnormality must be sent to hospital. In any community, of course, there must be a minimum number of beds for emergency cases. Quite another aspect of the case is shown when a review is made of the more prosperous districts in which although the bulk of the houses are quite suitable for home confinements, there may be quite a proportion of women, imbued with the modern ideas of hygiene, who elect to go to hospital rather than upset the household and in many cases because they believe that it is the right thing to do. This class of patient can be expected to contribute substantially to expenses, and actually its members do not belong to the category of those who require on economical grounds to be admitted to hospital for the confinement, so that mere mention of its existence is enough. With all the above factors in mind, the nurse will not be surprised to find that although it is considered to be satisfactory in general circumstances to have one bed allocated for every 7,000 of the population, a much bigger provision may be called for when in the more crowded areas—industrial towns and so on—the local conditions already mentioned demand more beds; various figures up to 1 in 2,000 may be arrived at. Again as an index of the population and its type, in any district the percentage of hospital cases may vary from 3 to 30 per cent of all maternity cases occurring.

So far as the priority cases are concerned in any neighbourhood, we may assume that as a result of careful antenatal observation by doctors, midwives and nurses in the home and at the welfare centres, certain numbers of women are noted as likely to require hospital treatment when the birth is due (e.g. when Caesarean section has been decided upon). The priority and planning associated with the emergency case have been mentioned above,

and apply to the sudden and unexpected emergencies which occur despite all prenatal care and all skilful attention at the start of labour. The reservations in the above 2 categories must be first on the list. It may be assumed that the tendency is towards gradual building up of the "bed-strength" of modern maternity hospitals and wards, and the future holds prospect of institutional provision for a high percentage of pregnant women.

Death of the Child in the Antenatal Period.—This subject has been dealt with to a certain extent in Section XII. Whether the cause of death be abortion, prematurity or still birth, the salient point is that instead of a living child being produced as a result of the pregnancy, the latter is terminated by parturition of a dead organism, mature or immature, viable or non-viable. It is this wastage that causes efforts to be made to reduce the number of abortions and still births; as far as can be calculated in England and Wales, the former amount to not less than 180 per 1,000 live births. The law states that all cases of children born dead after 32 weeks of pregnancy must be notified and the birth must also be registered. There are roughly 30 still births per 1,000 live births. Of the causes of still birth, the nurse need not tax her memory too much, but difficulty in labour, on the part of the mother or caused by the foetus may be said generally to be the main cause.

Methods of Prevention.—In the routine investigation carried out at welfare centres and other places and now universally established as essential, careful examination of the obstetrical and general condition of the pregnant woman will provide the usual warning signals, when such exist. There is no need to reiterate what has already been said. All the machinery of modern investigation and of specialist service will be put in motion when there is any sign of conditions that make for still birth. If need be, the patient may be admitted to the hospital early, but depending upon circumstances she will be kept under efficient observation until it may or may not be necessary to take some appropriate action. Contracted pelvis of varying degree must be assessed for what it is worth in each case. Even the slight degree of contraction may cause ultimate difficulty in labour; all up-to-date child welfare centres as already stated have modern x-ray installations and facilities for pelvimetric examination by obstetric specialists. In some cases the obstetrician may require the help of the radiologist during the actual course of labour.

In the case of venereal diseases, syphilis is a very common cause of foetal death, but a glance at the latest figures (after early and efficient treatment, 5 per cent still birth; untreated cases 60 per cent) will convince everyone, however sceptical, that antisyphilitic measures are very much worth while. It may be remarked that consideration is generally given to the woman

who is pregnant and syphilitic and who has, for various reasons, to attend a venereal diseases clinic; special accommodation is provided for her and in many ways she is saved much of the routine associated with such clinics. Sometimes venereal disease may be treated at the welfare centre; everything depends on the local conditions.

With regard to gonorrhoea, fatal results are rarely reported, but the effects of ophthalmia neonatorum are well known. Any woman discovered to be suffering from gonorrhoea may be dealt with as described above. The precautions to be taken when the child is being born have already been discussed (see Section XII). The subsequent treatment of ophthalmia neonatorum and the regulations in force regarding notification and treatment have been dealt with also in the same place.

Among other causes of death of the child in the antenatal period is toxæmia; as might be expected, when the mother has poison circulating in her blood, the toxins pass via the placenta to the foetus and death of the latter may thus be caused. A few words may be added here to what has been said about the premature child in Section XIII. In order to save as many lives as possible, much importance is attached to the treatment of the premature child. The hospital arrangements in connexion with this have been discussed as above; the transport side is one for the local authority as a rule, and as the special treatment can with very few exceptions be carried out only in a maternity hospital, an ambulance with superheated equipment and appliances may be required. If it should be necessary for infants prematurely born to be nursed in their own homes, some welfare centres have schemes which envisage the supply on loan to the mother (always provided that there has been preliminary consultation between the doctor or midwife concerned in the case and the medical officer of the child welfare centre and approval given) of a complete outfit for the purpose. This consists of a cot made of metal and specially constructed to be absolutely draught free, a blanket with attached electrical heating fixtures, special type feeding bottles (see Section XIII), oxygen apparatus and various other appliances. The usual precautions against sepsis or infective fevers have to be taken in the household concerned.

Lastly, so far as antenatal precautions are concerned, it is customary to consider the neonatal deaths which occur, if not almost immediately after the birth of the child, at least within a month of birth. There is no actual difference in the type of death, for it is generally obvious that life cannot last long; the child has been injured or otherwise rendered unfit for extra-uterine life while in the uterus or during birth and for all practical purposes it is in the same category as the child which is born dead. In all the antenatal routine, therefore, the effect of care

is extended beyond the date of parturition, and in substantiation of this statement the problem before the welfare worker is one of reducing the number of neonatal deaths per 1,000 live births, the figure at present being about 30.

Prevention of Infant Mortality.—According to generally accepted principles of calculation, the infant mortality index is reached as described on page 383. It is obvious that the ratio is only a conventional one, but the importance lies in the obtaining of a series of results every year which can be used for comparison and for information with regard to number of deaths per 1,000 live births. The results of a study of infant mortality figures show that males do not survive so well as do females. About 40 per cent of the total infant mortality for the first year occurs in the first 4 weeks and is thus to be classified under the heading of neonatal deaths. As a rule the 2 commonest other diseases causing death in the first year are pulmonary infections and gastro-enteritis.

Effect of Social Conditions.—Many considerations have to be made with regard to the effect of the home and surroundings on the incidence of infant mortality. It has been proved beyond doubt that an atmosphere of domestic stability, and with it, placidity, is conducive to infant welfare. The first few days of infant life are so critical that every influence at work, good or bad, has its effect. As already mentioned, the dwelling house is not the main factor; it is the individual that counts. A mother may be a hard worker, indeed she may have an occupation outside her home and work at it until the last day, and at the same time she may bring up a large family successfully. It is always the pious wish of all associated with child welfare and maternal happiness, however, that the mother should not have to work outside her own house, and thus it has to be admitted that the normal circumstances of marriage are the most suitable for child-birth and infant development. Apart from the situation in which the mother has an outside job, therefore, the true causes of infant mortality will be found in the woman herself; if she be dirty, untidy, slatternly, the household will be a reflection of her defects, and insanitary, unhealthy conditions will be the result, these undoubtedly having their effects, as all doctors and nurses know, on the children, and especially on the infants. In every case of infant mortality the review of the factors likely to have caused the death may show among other things that there is little or no evidence of maternal attention, that the house is overcrowded, that many hygienic essentials are lacking, that food is of poor quality, that the family income is low, that consumption of alcohol is excessive, and in cases in which death occurs in the later months, that bottle feeding is imperfect. Again we must bear in mind that the mother may not be physically capable of

doing her best for the child, and mentally she is often completely tired of life, depressed to a state of melancholy and in utter despair. The above are the problems now being valiantly tackled by the welfare centres, and the fact that infant mortality is steadily on the downgrade is an earnest of the good work that goes on. Only those who have had the opportunity of close experience of this type of work can fully appreciate the difficulties. Perhaps the most distressing case of all is that of the illegitimate child; this unwanted creature is often born in difficult circumstances and even in secrecy, and struggles to life after many vain attempts on the mother's part to procure abortion by taking drugs; it is put in the care of some ageing woman, generally not a relative, and statistics are there to show how such a disastrous beginning to life generally ends.

The Work of the Welfare Centre.—There is no better chance of seeing how successful child welfare work is than that afforded by the infant consultation clinic. The ideal, of course, is that the mother should have been in touch with the clinic since the early days of pregnancy, and the attendance at the infant clinic is merely the natural step forward. The local authority, however, has a chance to keep a check on every baby born. Under Part VII of the Public Health Act of 1936, it is incumbent on the father of the child to notify the birth, whether the infant be dead or alive, provided pregnancy has gone on for 28 weeks or more. The notification must be made to the medical officer of health, within 36 hours of the birth and in writing, and in cases in which the father is not living at the address at which the birth has taken place, the notification may be made by anyone who has been present at the birth or who has attended the mother within a 6-hour period after the birth. To make things as easy as possible, the written notice that is necessary may be printed and issued, generally in the form of a stamped and addressed postcard on the back of which the official form of notification is printed; these forms are sent when asked for to doctors and midwives in the district. There are penalties for non-notification. The practical aspect is that in the normal course of events the doctor or midwife may save the somewhat harrassed father the trouble of obtaining the document in question. The midwife as a rule hands the card to the father, sees that he signs it, and posts the card herself, and many doctors do likewise; therefore the main purpose of the scheme—to inform the medical officer of health of every birth that occurs in his district and within the time stated in the Act—is fulfilled. The doctor or the midwife as a rule takes it upon himself or herself as the case may be also to remind the father of his duties towards registration of the birth, which is quite a different matter, and which must be done in the usual way.

Since the M.O.H. has an early notification of a birth, he is able to consult his records and find out how much the mother may have taken advantage of the welfare centre; in many cases he will delegate the "follow-up" work to the medical officer in charge of the nearest welfare centre, and in cases in which a midwife has delivered the child, a health visitor goes to see the mother. This may be the first contact with the family, and it is useful, in that a chance is given to the health visitor to find out exactly what standards exist. If a doctor has been attending the case, it is customary to let him know that the health visitor would like to call, and very often the doctor is glad to know that such a visit is contemplated; as a rule, however, health visitors do not make calls on "doctor's cases" until the doctor has ceased to attend. The health visitor generally informs the mother of the facilities of the clinic and gives her an invitation to bring her child; in many places a leaflet describing in simple language the work of the clinic is handed to the mother also.

It will be observed that by an entirely orthodox and gentle method the infant is brought voluntarily by the mother; nowadays, however, the success of infant welfare is so obvious and the confidence put in it so great, that mothers need to have very little persuasion. In fact, we are reaching a state of affairs in which the woman in an industrial area at any rate who has not had antenatal help is very much in the minority, and therefore continuance at the clinic after the birth of the child is natural; furthermore the propaganda of the other women in the district is almost certain to induce the reluctant mother to make her first visit.

The Infant Consultation Clinic.—This may be regarded as a forum of young mothers, and it is an example of education obtained by interchange of experiences, in addition to knowledge imparted by experts. Clinics are conducted in different ways, and in general the routine depends upon the amount of service available and the size of the staff. But in the average clinic, the mother sees the nurse every week and a general check is made on all the items which count in the advancement of the baby. As a rule the doctor is in his or her own room, to which selected cases are sent for consultation. Normally the nurses, trained as they are, are able to cope with the cases, and keep the records. The child is weighed at intervals, not necessarily every week. When the mother is feeding the child at the breast she may ask for information from the nurse and may be given quite a lot of help so far as general mothercraft is concerned. In some clinics, there is a class for mothers who want to make clothes for their children; ample literature is available, and instruction is given with regard to the best way to use materials and for infant wear. A great number of questions are regularly fired at the nurses, especially with

regard to artificial feeding; it is customary to give regular demonstrations at clinics, which as a rule prefer to recommend one type of food and one method of preparation. On occasions, too, visiting specialists and members of the staff of the welfare centre may give lectures on any subject pertaining to the rearing of children.

Although the consultation clinic is intended to be a prophylactic institution, certain infantile ailments may be dealt with, but as a rule the sick child is directed to another clinic or even to a hospital, or a note may be sent to the family doctor. Vaccination against smallpox is not now compulsory but it does not mean that the practice of vaccination has ceased, and as in the past, vaccination clinics may be held once a week, with the vaccination specialist in attendance. The nurses at the infant consultation clinic are also enjoined to look after the mothers' health as well as that of the infant. A nurse, seeing a mother week after week, soon becomes aware of any break in her health; this is not an uncommon thing these days, especially in view of food rationing, and nursing mothers may be given extra allowances of milk so that they may have up to 2 pints per day; other vitamin foods may also be provided. It is the duty of the clinic nurse to ensure that both mother and child have the best chance to make progress; under the scheme already referred to mothers and their infants may be received for a period in a convalescent home in which dieting is one of the main features. Once again the services of the health visitor may be called in also; if it should be considered that domestic circumstances are hindering the progress of mother or child or both, the health visitor may make a call and find out what can be done. There is a great field for the voluntary as well as the professional health visitor. In some cases, the health visitor may find that the household atmosphere is not suitable for the child or that the latter is not thriving because of domestic difficulties, and it is possible nowadays to arrange for weakly infants to be transferred to infants' hospitals in which special feeding methods are used suitable to each case and the child may be tided over critical weeks or months until it is more robust in constitution.

Education in Mothercraft.—In addition to the routine talks and practical demonstrations mentioned above, there are various other ways of disseminating information on this important subject, and in certain communities evening lectures have been arranged, so many in the course, which give a fair general education in the elements of mothercraft. The subjects covered are in effect those discussed in the present chapter, and in many cases films are shown and literature sold or given out. Practical work is an essential part of the programme. A more modern development is that of extension of mothercraft training to girls'

schools, in which the fundamentals are taught sometimes by a visiting nurse and sometimes by a qualified domestic science teacher.

Conclusions.—From what has been said in the foregoing pages, nurses will no doubt realize how great nowadays is the call to understand the work of infant consultation clinics and all associated services. It is clear that the nation intends to do its utmost to give every infant the best possible chance of starting life with the maximum of advantages.

Care of Children up to Age of 5.—Every child, on reaching the age of 5 and unless there is good reason to the contrary, must be sent to school. The infant consultation clinic will undertake to supervise the child until it reaches its first birthday. What, then, happens to the children between 2 and 5? For a long time they presented a problem to the social organiser, but now it would seem that like everything else they are coming into their own. The period referred to is most important in a child's life, and much of the information concerning it has been already given in Section XIII; to sum up briefly, this is the period during which the child has its battles with organisms, and the trial of strength is on. It must be appreciated that the child is growing fast, is reacting forcibly (for good or for bad) to environment, is developing mentally and is indeed very much a creature of circumstance. Rickets, dental troubles, early rheumatic infections, postural deformities, ocular defects, "tonsils and adenoids", pneumonia, whooping cough, measles, diphtheria, chronic cough, intestinal worms, ear troubles—all these are familiar entries in the doctor's lists and the hospital records. Domestically the "toddler" is a burden, for in any busy household, with the new baby coming or just arrived, such children are a drain on the mother's energies and patience. They are indeed the Cinderellas of the household, with no one to play games with and with too little self-responsibility to be allowed out of the mother's sight for any length of time. It must be agreed that this period is the weak link in the chain, although much is now being done to strengthen that link.

Clinics, Creches and Day Nurseries.—The story of the work done for pre-school children properly begins with the health visitor, for it is generally she who discovers the toddler caking himself with mud or crying in the corner because his bones are sore. If she is lucky, the health visitor will be able to recommend that the child be sent to a pre-school clinic, at which any ailments can be treated, just as they might be dealt with at a hospital. At the pre-school clinic, however, the child can be looked after with various others of his class; the only alternative to this—and necessary in towns in which there is not any pre-school clinic—is to make arrangements to send the child to a specialist at the

out-patient department of a hospital, but here we see that a great amount of decentralization occurs, and records are more difficult to maintain.

In so far as the day nursery (or its French equivalent, *crèche*, now Anglicized) is concerned, this is a development which had origin in bad old days of leaving children in charge of old women, many of whom were drunken and lazy. The main idea of the day nursery is to provide a place with supervision for children between 1 and 5 during certain periods when their mothers are otherwise occupied—at some job, or doing their shopping and so on. It is an institution that may also function as a night nursery, depending upon circumstances, and children can be kept there for a few hours if need be. Day nurseries must not be planned for more than 60 children, but as a rule anything up to half that number may be found. To appreciate to the full what is being done at the day nursery it is advisable to visit one when all the activities are in full swing, and in most cases there is ample material for the psychologist. The medical side is very simple, but a preliminary medical inspection is generally made when the child first goes to the day nursery, and every day the skin is examined for rashes or other pathological evidences, especially those of infective fevers. A note of the weight is generally made once a week. So far as the staffing is concerned, there is a matron who should have not only the S.R.N., but also other special certificates pertaining to day nurseries, e.g. that of the National Society of Day Nurseries and that of an established nursery training college. With regard to qualification for positions in day nurseries, a probationary period of 2 years is necessary, during which the nurse has opportunities for practical and theoretical instruction. The diploma of the National Society of Day Nurseries may then be awarded to those who prove themselves to be proficient in first aid, sick nursing, hygiene, infective diseases and various other subjects including elementary psychology as applicable especially to children. Another essential is that the candidate must have had 6 months' experience of nursing in a day nursery. Nurses of this category naturally form the backbone of the day nursery staff, but there is ample opportunity for the voluntary worker or even the part-time paid worker (unqualified). The National Council for Maternity and Child Welfare has established a group of women known as the Child Care Reserve and members of this group may be of great assistance. In some cases classes of kindergarten type are arranged for and a specially qualified teacher is put in charge.

With regard to the residential aspect of day nurseries, certain establishments are organized to function as temporary homes for young children. These children are very carefully selected and are admitted only after strict enquiry into circumstances. Such

homes serve an excellent purpose and undoubtedly help to solve many domestic problems. The children accepted are 1. children who have been deserted, and who require to be accommodated until arrangements can be made for their adoption; 2. children of illegitimate birth, admitted for the period during which the mother may have to establish a home or make permanent arrangements for the child's supervision while she is at work; 3. older children up to the age of 5, on account of the fact that another child is expected in the home and domestic difficulties are great, or because the mother has been sent to hospital; 4. lastly, weakly children, whose condition demands special feeding and care. In such circumstances the nursing strength must be great; 4 nurses would be required for 12 children under 2, and about half that number for those of 2 to 5 years of age. Nursery schools are referred to in the chapter which follows.

Child Life Protection

Under the above heading there have to be considered various measures which have become effective within the past 20 years in order to safeguard the physical and mental health of the child, more especially those who are brought up under somewhat abnormal conditions. Briefly then we may examine the situation with regard to cruelty to children, to employment of children, to adoption of children and to the foster-child.

Cruelty to Children.—The Act which applies here is the Children and Young Persons Act of 1933. In this Act are various regulations for the control of parents or guardians who may be neglectful. There are many offences apart from those associated with excessive punishment and violence towards the child. One of the main points about the Act is that neglect amounts to a contravention; cruelty in any form to a child below the age of 16 years by anyone over 16 years of age may bring heavy penalties.

Fire.—Exposure of children to dangers is an offence. For instance, it is essential that all guardians over 16, of children under 7, should ensure that burning accidents are prevented. If it should happen that any child under 7 is left in a room where there is an open grate with the fire lit, and without any fire-guard, and further if that child should be burned by coals or other fuel or scalded by boiling water from a kettle, and should be severely injured thereby or even fatally injured, the person responsible may be charged under the Act and punished by fine or imprisonment up to 2 years.

Alcohol.—At one time it was quite a common practice to offer small quantities of stout or other mild alcoholic beverage to small children sitting at the table with their parents. No doubt on

account of this and for other reasons, too, the Act states that no child under 5 must be given intoxicating liquor (the age-limit might well be advanced considerably). Children are also debarred from public houses, although the observation may be made that it is doubtful whether it may not be worse for the child to stand in the cold or wet outside a public house while the mother is inside having a drink. Lastly there is a responsibility put on cinema owners and others in similar position who give special performances for children. Strict safety regulations have to be observed.

Employment of Children.—The present generation may not be aware of the fact that about 50 years ago it was common for children of tender years to be up at an early hour of the morning and spend several hours before going to school in delivering milk, morning papers, morning rolls and so on; similarly children did evening work after school. The Children and Young Persons Act referred to above forbids the employment of any child who is under the age of 12 years. With regard to those of school age but more than 12 years old, the main regulations state: 1. that on any day on which a child of 12 and upwards is expected to be at school, he or she must not be employed during school hours; 2. that even when the child is employed outside school hours on any school day, he or she must not be so employed for more than 2 hours; 3. that on Sundays the limit for employment is 2 hours; 4. that work in such circumstances must not on any day of the week begin before 6 a.m. or extend beyond 8 p.m. These regulations are important and have to be carefully observed in order to keep within the law. The nature of the work is also carefully controlled by law; the appropriate clause is to the effect that a child in employment must not be asked to carry or lift any weight that is too heavy for his or her physique. There is power given to the local education authority (Education Act, 1944) to intervene in the case of any school child observed to be overtired physically or mentally and indeed in any way harmed by the fact that he or she does work outside school hours. The teacher, doctor or other person in charge may consider that the child is being denied the benefits of proper education because his day is too full or because his constitution is not strong enough. In this case the education authority may write to the employer to ask him to stop employing the child; the child may be allowed to do a certain amount of lighter work or to work for shorter periods, but the main object is to put the child's health and education first and to regulate the amount of outside employment accordingly; hence the provision in the Act for the obtaining of certain information from parents or employer or all three with regard to the exact nature of the employment, so that a careful judgment may be made. There

are fines and imprisonment for contravention of the law on the above subject.

Adoption.—The appropriate Act is the Adoption of Children (Regulation) Act of 1939. Adoption of children is very strictly controlled and the reasons for this are sound ones. A child can be adopted by suitable persons, but only through the medium of the local authority or of an approved adoption society. The routine commonly in operation is that the registered adoption society (an entirely charitable organization), or the local authority, both of which act under Regulations made by the Secretary of State, conducts preliminary investigations with regard to every individual application from would-be adopters. Various forms have to be filled in and the society must satisfy itself that the adopters are suitable in every way. The preliminaries having been completed, the child is then handed over for a probationary period of 3 months. At the end of that time, always provided that neither the society nor the adopter has written to state that the adoption must not proceed further, it is incumbent on the proposed adopter to apply to the Court for an adoption order. This may be granted by Courts which are given powers. The Court makes careful investigation, the child's interests being first in its mind, and keeps control of any allowance that may have been suggested in consideration of the child's upkeep. Unofficial payments are forbidden; this is in order to stop any attempts at bribery or of misapplication of money intended for the child. When the probationary period shows that adoption is not feasible, the adoption society or local authority must take the child back. An adopter must satisfy any child protection visitor that the child is being properly treated. This is almost certainly so in most cases, but the visitor has the right to examine the child and report if need be. It should be noted that advertisements asking for the adoption of a child are illegal as are those inserted by persons wishing to adopt a child. The only allowable method is that described above. Nurses should be able to advise their patients on these matters.

The Foster-Child.—In the Public Health Act of 1936 many provisions are included with the object of ensuring that children in charge of a foster-parent and for whom payment is made should be properly looked after. This part of the Act was clearly demanded by events, for at least up to the end of the nineteenth century, if not later, the term, baby-farmer, was one which was charged with suspicion and opprobrium, and many serious cases were brought to light. Nowadays, although there is no objection to the placing of a child in the care of foster-parents, it must be absolutely certain that the child will not suffer in any way. The main provisions are as follows. In the first place there are limits to the application of the term, foster-parent. So far as relatives

are concerned, or guardians legally appointed, it is obvious that the Act need not apply; similarly various institutions, boarding schools, hospitals or other establishments of such type do not come within the Act. With regard to the person or persons who indicate their willingness to accept a foster-child, the law clearly ordains that such persons must not have any interest beyond the fair remuneration for board, lodging and so on. For instance it is an offence to insure or attempt to insure the life of a foster-child so far as the foster-parent is concerned, and the insuring body is also liable to punishment under the Act. Careful investigation of the potential foster-parent or parents is always made and the premises must be of a certain standard of cleanliness and sanitation, not likely to endanger the health of the child. In any case of doubt, with regard to the foster-parents or the house in which the child is to be received or is indeed living, the welfare authority may apply for and receive from a court of summary jurisdiction an order to permit "removal of the child to a place of safety," as stated in the Act. The latter may be any institution mentioned already in this chapter or another household known to be satisfactory.

Regulations.—It is incumbent on the foster-parent who proposes to accept for payment into his or her household any child under the age of 9 who is an orphan or who is separated from his parents to give 7 days' notice to the welfare authority of his or her intention to do so; in the case of additional children to be received, at least 2 days' notice must be given. Any changes, e.g. removal of the child, death of the child or change of dwelling house must be reported.

So far as the general supervision of foster-children is concerned, certain visitors are appointed in an area, generally from the roster of health visitors, whose duty it is to go round at intervals and satisfy themselves that the child is being properly looked after; they may also give any necessary advice to the foster-parents, ascertaining also that there is no skin disease or, say, a rash of measles or scarlet fever to be seen. These visitors do excellent work; they are generally referred to as child protection visitors.

CHAPTER 5

HEALTH OF THE SCHOOL-CHILD

HEALTH LEGISLATION. MAIN PROVISIONS OF ACT OF 1944.
THE SCHOOL. BUILDINGS. SANITARY ARRANGEMENTS.
PRINCIPLES OF HEALTH SUPERVISION. MEDICAL INSPECTION.
ADDITIONAL MEDICAL SERVICES. INFECTIONS.
MEDICAL TREATMENT. THE SCHOOL-CHILD'S AILMENTS.
NURSERY SCHOOLS. ORGANIZATION. EDUCATION. SPECIAL
SCHOOLS AND EDUCATION METHODS THE BACKWARD CHILD.
BLINDNESS. DEAFNESS. DEFECTIVE SPEECH. FITS. THE
CRIPPLED CHILD. THE SCHOOL NURSE. AIMS OF THE SCHOOL
NURSE. VOCATIONAL GUIDANCE. DATA ON CARD.

WHEN it is considered that in Great Britain about 10,000,000 of the population are school-children, it is clear that educating in the ordinary subjects cannot be the only function of the teacher. For here we have a great section of the people, all young and growing, all in the formative stage of life, mentally and physically, and all with great social and economic problems before them. One of these problems is the achievement and maintenance of good health, and certainly an excellent chance is afforded for the proper application of the principles of hygiene and social medicine. It is not surprising, therefore, that the State has recognized the full possibilities of education and has sought to bring to the school-child not only education in the principles of healthy living, but practical demonstration of how such principles apply. We have spoken often about the organism and the environment; in the case of the school-child, the aim is to make his or her attendance at school one which will bring nothing but health and happiness; for this reason, although the domestic environment cannot be regarded as a constant in all cases, the school atmosphere can certainly be one of near perfection, so that those who live in it must reap the benefit of healthy surroundings. Despite all these attributes, however, the school cannot alter the protoplasmic cell of the child, and thus the teacher must envisage his class as consisting of the very robust and the very weak, the attentive and the non-attentive, the overfed and the underfed and so on. School health aims at a primary weeding out of the obviously weak and unfit and the transfer of them to special schools or institutions; secondly it

seeks to keep a check on the remainder, all of whom come up to a certain standard of health and all of whom are inspected at intervals and thus kept under medical supervision. More than that, the State makes generous provisions so far as extra food and supply of vitamins and other essentials are concerned, and offers to a certain extent medical and surgical treatment for ailments of school children. The study of school health may well begin by a review of the law as it stands with regard to education in general and to school health in particular.

Health Legislation

Although there are separate Education Acts for England and Wales and for Scotland, viz. the Education Act of 1944 and the Education (Scotland) Act 1945, these are substantially the same. The Acts are the culmination of many years of advance and replace for the most part any Acts which have gone before them.

Main Provisions of Act of 1944.—The Education Act of 1944 might be termed the school-child's Charter, for it establishes education on a basis never before so solid, and it brings in many reforms. There is now a Ministry of Education, and a Minister. With regard to local government the authority may be the local authority of counties or county boroughs, but in other cases joint education boards are set up. The work of directly administering the Act, however, devolves on special education committees appointed by the local authority under the Act.

Age.—All parents are bound to send their children to school; compulsory education applies to boys and girls between the ages of 5 and 15. Once the latter age is reached the child may leave school. What the Act terms further education is available until the child reaches the age of 18. County colleges (junior colleges in Scotland) will undertake such additional instruction, and will allow comprehensive development of knowledge of theoretical and practical character pertaining to many vocations.

Scope of Education.—The authorities must provide schools and other establishments for all ordinary children, and as mentioned above, any child not up to normal standards or in any way suffering from permanent disability may be given the opportunity of a course of education suitably modified; often treatment (e.g. in cardiac disease) is associated with education. The usual course of education is divided into grades as follows: 1. Primary; 2. Secondary; 3. Further education (see paragraph above). There are voluntary schools as well as county schools. So far as what might be termed the special schools are concerned, there are provisions for nursery classes, nursery schools (see previous chapter) and special and independent schools.

Medical Provisions.—Medical inspection is offered, but as the

law now stands if any refusal to have a child examined be considered unreasonable, powers are given to the authority to demand that such examination be carried out. In schools and county colleges, a daily supply of milk and provision of dinners for the pupils must be organized. In specific cases clothing, footwear and other necessary clothing may be supplied. The Act emphasizes that in all ordinary schools of the 3 grades mentioned there must be abundant time and opportunity for pupils to become trained in physical efficiency, to learn the fundamentals of social science and to have ample amount of recreation. So far as the science of health is concerned, in addition to the fact that medical attendance to a certain degree is available, the authority can take steps to ensure that the pupils are clean. The whole subject of school premises is dealt with below. With regard to attendance, when a child for some good reason has to travel any distance, transport must be provided or expenses defrayed; similarly, although the child may be in attendance at a school which does not charge fees but which offers facilities for boarding, the latter may be paid for on a certain scale. It should also be kept in mind that under the Act the authority may control, or even prohibit, the employment of children, as stated in Chapter 4.

Summary.—To sum up the aims and objects of the Education Act so far as health is concerned, we may take it for granted that nothing is to be left undone to establish the fundamentals of good health among boys and girls. Every possible effort is being made to provide a wide education, including that of health, and the schools themselves will set the example by adopting every hygienic measure that will make for welfare.

The School

As in housing schemes, the ideal cannot always be attained, and just as houses are often grouped round factories for convenience, so in certain cases the school must be in a congested area. However, in conformity with town planning and other schemes, the schools about to take shape in many parts of the country will have ample space and a satisfactory amount of open ground round about them. The amount of surrounding space need not be given in detail here, but the whole conception of the modern school is completely changed from that of the less enlightened days when it was thought that the best place was right in the heart of the town, preferably in the main street. The idealists now hope for noiseless buildings and freedom from dust, smoke and any other vitiations of the air, they would also like to think that when a scholar wanted to borrow a book or have a swim or go to see the school doctor he would only have to go round the corner. In the present era, such services cannot

be made available except in a few cases, but facilities such as these are well worth striving for.

Buildings.—Architects have devised various suitable patterns, based on a common plan of greatest hygienic benefit, including ample provision for sunlight, ventilation, heating and drainage. Many schools are planned on the two-storey principle, with verandahs on the ground-floor level. With regard to classrooms, every pupil should be allowed about 16 square feet of floor space, and the ideal number of children in any room varies between 30 and 40 according to school grade. Interior decoration should be bright. The windows must be large and the types of artificial lighting should not cast shadows. Sound-proof rooms are to be aimed at. The care of the child's eyes is of such importance that the old stalwart of the classroom—the blackboard—has now become the yellow board, and blue chalk is used for writing. In many other ways methods are adopted for preserving the child's eyesight, some of which are referred to later. Seating accommodation, sound amplification and many other additions and improvements on classroom patterns have all now been introduced.

Sanitary Arrangements.—For washing there should be provision of wash-hand basins with hot and cold water, 1 basin being allowed for every 10 pupils. Plain white soap in solid form or liquid soap should be provided, without any disinfectant addition. The towels must not be allowed to become wet and sloppy, and in cases in which the ordinary roller towels cannot be replaced often enough, paper towels may be used. Some schools may be fitted with spray or shower baths, but in such cases there must be proper provision for dressing and the towels must be dry. In cases in which there is a school swimming bath, the size, depth, temperature of water and length of stay in bath are all subject to regulation standards.

Cloakroom accommodation must be ample and must be apart from the classrooms or passages. Lockers may be provided and wet clothes and footwear must be dried during school hours; ample space for hanging up hats and coats is essential. Latrines are governed in number and size by regulation and follow the usual sanitary principles; needless to say water carriage is the ideal method of cleansing.

Principles of Health Supervision

The school medical service has grown very fast and now covers much ground. In the Act of 1944, still greater scope is given to the school doctor. The Act states that the authorities must arrange for regular medical inspection of the 3 grades of school. If necessary, schools outside this group may also be inspected

The fundamental principle governing this procedure is that no matter what the age of the scholar may be, he or she must be submitted, or submit, to medical examination as reasonably demanded.

Medical Inspection.—Perhaps the best way to describe the routine of medical inspection would be to begin by explaining how records are kept. When a certain group of children is due to be examined by the school medical officer or his deputy, the head of the school must inform the parents of the proposed examination, and in order to obtain parents' consent or otherwise, a notification is sent. There is an official form, which is delivered by the pupil and which invites the parents to be present. Most parents consent, the mother sometimes indicating her intention to be present, especially at a first examination. But when there are any refusals, or in cases of non-return of the form, the authority may take the compulsory step referred to above. As a rule 3 examinations by the doctor are carried out during the period spent by the child at school. The records are kept on a special card, which is the standard medical record card for all schools, and which describes personal history and present condition, with notes on eyes, ears, speech, mental state, heart, lungs, defects and so on; finally there is a space reserved for notes on vocational guidance, which is discussed later on in this chapter (see p. 418).

The head teacher or his deputy fills in various non-medical particulars on the card as soon as consent has been given by the parent or guardian, and when all the cards have been prepared, the medical officer may be notified. Generally only a certain class or form is examined at one time, and a few days in advance of the school medical officer there arrives the school nurse, who is, needless to say, trained and experienced for the job. Her duties may be summed up as follows: 1. general survey of the child with regard to cleanliness, clothing, footwear and nutrition; 2. taking of weight; 3. height measurement; 4. for children over 6, eye testing in which Snellen's types are used. The particulars are noted by the nurse on the medical inspection card. Very soon after the nurse has completed her work, the doctor pays his visit, accompanied by the school nurse; parents or guardians who have signified their intention to be present will have been duly informed of the date and time of inspection. The doctor makes many notes with regard to the headings mentioned above, and if in the course of his examination he should discover defects or abnormalities, he discusses the matter with the parent; when the parent is not present an advice note is sent home with the child who has been the subject of the examination. In this note the doctor states simply what he has found and may urge the parent to give him a call; or he may

suggest that the child be taken to the family doctor. If there should be no response from the parent, the school nurse will make a special note of the case and watch the child's progress; if she is not satisfied, she should make a report on the situation to the medical officer. It will be evident that the whole purpose of school medical supervision is to ensure that parental neglect does not jeopardize the health of the offspring.

At the second and third examinations, the information on the cards is added to and thus a history of the general health of the child is made up. A special aspect of medical inspection concerns pupils who for various reasons have been noted by the teachers as being rather out of the ordinary in a mental or physical sense. In any class of children, there are one or two who attract attention because of some outstanding peculiarity. For example there may be deafness caused by discharge from the ears or by other aural troubles; the pupil may have obstruction of the nose, or adenoids, and may breathe by the mouth, this disturbing the others in the room; eczema or other skin diseases, not necessarily of an infective type, may give rise to doubts with regard to general hygiene; day-dreaming or restlessness or any other unusual sign may also bring the unfortunate pupil into prominence. In all such cases, it is the privilege of the headmaster or headmistress to ask the school medical officer to give his opinion.

Additional Medical Services.—A routine inspection of the school buildings may be carried out at intervals or by special direction of the medical officer of health, this procedure involving examination of all lavatories, cloakrooms, classrooms and other departments; this is to safeguard the school-child against any source of disease which may remain in old-fashioned water closets and similar places. The school medical officer may also be asked to plan or to approve schemes of health education for pupils, these including courses in hygiene and gymnastics; he may have to put a school in quarantine or close it temporarily or exclude certain groups or individuals from school for a certain period, the motive in these cases being the prevention of spread of infective diseases. Supervision of children mentally abnormal or physically disabled also comes within the scope of the school medical officer's supervisions.

Infections.—A brief review may be made now of the precautions taken in schools against infective diseases. School-children in the mass are apt to contract and spread infective disease, but each child has his own individual susceptibility, because he may have developed a certain immunity according to the exposure he may have had in living in an atmosphere in which small amounts of infective matter have been present; constant living in such an environment may have built up a strong immunity. On the contrary a school-child reared in a more

refined atmosphere may be very susceptible to infection when he meets it, and this is his situation when he mixes with his fellows at school. For these reasons it is essential to be very watchful so far as the average school-child is concerned.

Procedure.—The infectious case may occur in the pupil's own home, in which case notification may reach the school medical authorities by way of the medical officer of health. Sometimes the condition is recognized at school. In any case, the first duty of the doctor is to examine the contacts and this means that the whole class should be passed in review. As a result of the examination, the doctor may find a carrier—the cause of all the trouble—or signs of a past infection which may also have been the origin of other cases. Finally the doctor has the opportunity of discovering early cases. By these means strict control is kept over outbreaks, and very rarely will it be necessary to close down the school as described in the previous paragraph.

Prevention of Infection.—First and foremost the ventilation of the school is to be properly maintained. Modern schools will have automatic regulation of air and heat supply, but older schools may have to depend upon personal supervision by the teacher. Cleaning of classrooms is of the greatest importance. There should be a constant war on dust, which, as is well known, gives rise to throat and chest troubles, especially when children are breathing and coughing in the classroom. All necessary precautions (as already described as in use in hospitals) should be taken in classrooms to disinfect, dampen and mop up dust. Children should also be forbidden to suck or bite pens and pencils, and should, indeed, always use their own writing materials. The verminous child should be dealt with promptly, and special care should be taken that pediculosis or ringworm is promptly put under treatment. Hats and caps must be worn only by those to whom they belong; they should be hung on private pegs during school hours.

Medical Treatment

Under the Education Act of 1944, wide powers are given to local education committees to offer treatment to pupils in the various school grades, and in other schools by arrangement. Provided the parent or guardian agrees, every opportunity may be given to school-children to benefit by such treatment as is available, but as might be expected domiciliary attendance is not provided for except in very rare cases.

The School-Child's Ailments.—In the normal routine examination of each child the teeth have been found to require more attention than any other organs of the body; there can be no denying that dental hygiene is very poor among certain classes

in Great Britain. Dental clinics have been established and children may have attention there. The two conditions next on the list are 1. swollen tonsils, generally accompanied by adenoids; 2. eye troubles, chiefly defective vision, but including also squint, inflammation of the lids (blepharitis) and conjunctivitis. The school medical officer may also discover parasites of various kinds (chiefly lice and scabies), conditions of swollen glands, especially in the neck, malnutrition (undersize and underweight), rickets and heart defect. As a rule when these and other diseases are sorted out, and when the district in which the school is situated is a large one, there may be a special school treatment centre to which all specialists come, and for all practical purposes the clinic is similar to the out-patients department of a large hospital. The alternatives to this are 1. to send the child to his own doctor with a note; 2. since in smaller areas, only the lesser ailments are dealt with, to pass those with major conditions to the general hospital out-patients department. As might be expected the whole scheme amounts to a satisfactory arrangement with the hospital services available, the school clinic doing the maximum within its powers.

From the point of view of prophylaxis, apart from the daily supply of milk to school-children, it is possible to supply extra milk, vitamins and so on, to children who are below standard or otherwise debilitated, especially after an illness. Cod-liver oil, and other fish oil with malt, may also be provided. In many cases ultra-violet and infra-red treatment may be given at school clinics or elsewhere. Cuts, scratches and the usual results of the robust school life may be dressed, this being apart from the first-aid treatment which the majority of teachers are able to give in the emergency. Most school clinics also undertake the treatment of the parasitic diseases including ringworm and pediculosis and the commoner skin diseases such as impetigo and scabies. With regard to the eyes, examination and provision of glasses is part of the service and in cases of squint trained orthoptists may undertake the treatment of affected eyes, putting the child through a course consisting of so many exercises every day. All the above medical treatment is free.

Nursery Schools

As mentioned in the previous chapter, the subject of nursery schools is most appropriately discussed at this point. Although the normal age for going to school is 5, the education authority may set up a nursery school for children between the ages of 2 and 5. Various regulations are made with regard to structure and site; these should be convenient for the class of child and for the mothers who make use of the school. The school medical

officer examines all children before they are admitted (the mother or guardian being present when possible) and he inspects the school at intervals.

That this type of school is necessary or made use of need not be in any doubt. In the present era of demand for young women workers in the industrial areas, the potential population at nursery schools becomes almost incalculable, and already every one of these schools is strained by its complement. It has been stated that there are now signs that the number of children at nursery schools almost equals the number under direct maternal care at home. Expansion of the scheme, therefore, appears to be urgently called for.

Organization.—The minimum number to be accepted is 80, and for every 40 children there is a certificated teacher as well as day-nursery probationers; the school nurse is expected to examine the children every day. She keeps a note of any deviations from the normal course of health, and reports to the school medical officer on any diseases discovered. The whole equipment of the school is based on being convenient for the ages referred to; there is ample supply of hot water, soap, towels, lavatory accommodation and so on. An important part of the equipment is the portable bed, of stretcher type; this is used by the child for the compulsory afternoon rest which generally resolves itself into sleep. As a rule also the child is taught teeth drill, and has its own tooth-brush, face towel and so on. Three meals are provided—breakfast, dinner and tea—but there is also a liberal supply of milk and for certain children and at certain times fish oil and malt are available.

Education.—Although there is no attempt made at the formation of a class, there are to be seen the beginnings of a school discipline, with a time-table and some ordered programme of work and play. For instance, to say that the children have freedom does not imply that they conduct themselves like a pack of ruffians. The teacher in charge is the guiding spirit, relying on the principles of the system in operation. Certain children have to be restrained and certain children brought out; on the whole, character formation is very much in its primary stages, but the child is at an age at which it will react quickly to example. Drawing, colouring with chalks or crayons and singing and games in which all participate give the child outlet for his urges and provide helpful occupation.

The Nursery Class.—This class must not be confused with the above. In some schools, as a kind of adjunct to the infant department, there is a class consisting of children above the age of 3, but none of the special provisions of the nursery school are made (e.g., meals); the educational routine is on similar lines, however.

Special Schools and Education Methods

When for any reason (backwardness, blindness, deafness, defective speech, fits, paralysis and joint affections) the child cannot take its place in the ordinary school, special arrangements must be made for its education. These are usually combined with a routine of medical treatment, and it is very encouraging to see how much good work is being done in every department. Each of the disabilities mentioned above may be taken in turn, and the appropriate measures adopted in connexion with them may be briefly reviewed.

The Backward Child.—We have to be very careful in using the term, backward (retarded) child, for there are various aetiological possibilities, not always in direct association with mental slowness. A dull child is just an organism slower than the rest; nothing can be found to warrant the label of mental deficiency. A dull child may be too much of a brake on the ordinary class and it may require to be taught along with others in similar states of dullness. The backward child is one who is not up to the standard attained by others of its own age. In this group are many with different histories; some may have been ill for a long time and may have missed having education during that period; some may be weakly in physique or may have a congenital defect; in some, teaching may have begun too late; finally some may not learn easily, however hard they try.

Blindness.—Defective sight may be absolute or partial, and the latter may be dealt with first. In this group, if the oculist be satisfied that a certain degree of vision ($\frac{6}{24}$) is obtained after spectacles have been provided, he can refer the child to special classes in which the blackboard is placed very close to them and in which the books used are printed in very large type. Progressive myopia is a most distressing disease, as its name implies, and when school-children are discovered to suffer from it, they receive special attention, including the teaching of Braille methods, lest they should ultimately require to use them. They are accommodated in separate schools so that they are under close supervision and thus can receive every benefit by alteration of glasses and so on. The vocational training at myope schools consists in instruction in massage, piano tuning and various other jobs that a blind person can do. Partially blind children can now be conducted daily to and from school by guides or collected by bus, these services being organized by the education committee.

The child totally blind must be educated between the ages of 5 and 16. As a rule the child is sent to a residential institution, all expenses being defrayed by the State.

Deafness.—The problem of deafness, absolute or partial, congenital or acquired, curable or incurable, is one which is of great importance among school-children, and as in the case of blindness the onus is on the parents to obtain, and on the education authority to provide, suitable education. First of all let us examine the method of testing for deafness. The instrument used is the audiometer (gramophone type) which gives out at intervals numbers such as 99 and 111 at different degrees of loudness; this is an eliminating test, at least 20 children being examined at one time. When the children who cannot pass this test are again examined, an electrical audiometer is used. It has a means of recording the sound which the child can just hear. There is a fairly big class of children who are said to be "hard of hearing," which means that they cannot hear a whisper forcibly given at 6 feet distance with any ear, but they may hear with one ear at 3 feet distance. For this type it is often possible to have a special class in a large ordinary school.

Turning now to the absolutely deaf child and the deaf mute, these are children who cannot be put in any class of normally-hearing children. Teaching of the so-called deaf and dumb child has been going on for many years and with increasing success, and much of the latter is due to the perseverance of the pioneer teachers. There are day schools in the large towns, but the residential school is to be preferred; in this school all the modern methods of teaching are used—lip reading, sound amplification, pictorial charts and models and films. The so-called "dummy alphabet" may also be taught. Most teachers aim at producing the proper pitch in the voice of the mute who has learned to speak.

Defective Speech.—Much study is now given to speech defect, and children may often be trained out of it. As a rule there are 2 main types to be differentiated: 1. stammering, in which the articulation is not normal, e.g., because of congenital defect (cleft palate, deafness, tongue defect) or certain nervous diseases; 2. aphasia, which is purely intellectual, because the articulation is normal. A third (emotional) type has been defined—the stutterers—who do not have any physical basis for their defect but yet cannot get the words out. With regard to treatment, which is successful in half of the cases, the child is put for part of the school time in a special class and is given deep breathing exercises to do; special speech training and singing classes are also in the time-table. The child may be made to lie down for a certain period in the completely relaxed posture.

Fits.—As is well known there are various causes for fits, but in the majority of cases, apart from infantile dietetic errors, fits in childhood indicate epilepsy; there are many other confirmatory signs. There are various grades so far as mental impairment goes and here we are concerned with the epileptic child who is capable

of being educated; the others may require to go to the mental hospital. In the milder cases of epilepsy (*petit mal*) the children may go to the ordinary school, since the attacks are generally very slight and do not seem to upset the rest of the pupils. The law states that epileptics must be educated between the ages of 7 and 16, and parents must ensure that some action is taken with regard to such children; as a matter of experience, in nearly all cases the child is brought to the notice of the welfare centre very early in life and once it is labelled as epileptic, the local authority will guide the parents as to the best procedure. For the most part, epileptics are treated and educated at residential schools.

The Cripple Child.—There are many cripples and many institutions established in order to give them the best chance in life. The hospital and school may be combined, as already mentioned earlier in this work. According to the type of disability, the syllabus of education is arranged for each patient and many are taught their lessons although they are in bed. For cripples who live at home, a transport service is generally available to and from school, special types of which exist in large centres, some being day schools and some boarding schools. Many of these schools are conducted in the open air when weather permits, especially the sanatorium schools, in which lessons are limited to 3 hours per day. Since the causes of crippling may be tuberculosis of bone and joints, rickets, acute poliomyelitis and the many varieties of congenital defect, it will be clear to the nurse that there must be many categories of disability, and actually every child is made the subject of a special study, not only with regard to treatment but with regard to education. The fundamental idea behind all cripple child treatment is that as there is much spare time for the cripple, the best thing for his morale, for his intelligence and for his general welfare is that he should be educated. It will be appreciated that in most cases the education cannot be the full education given in ordinary schools, but it is sound and useful. For children who can sit up, special school furniture may be used according to the disability, and the trained nurse who is always present while the day school lasts is there to make any adjustments, to attend to dressings and splints and generally to be on the spot in case of emergencies. In the residential schools, the hospital side is generally well up to date, with ample orthopaedic apparatus and physiotherapeutic equipment, including baths and electrical appliances, these being supervised by chartered physiotherapists, who are also qualified to perform massage and organize medical gymnastics. To a certain extent physiotherapy may be available in the day schools, especially in defective conditions—knock knee, flat foot and the various postural defects.

The School Nurse

The school nursing service is one which will commend itself to all qualified nurses bent on a special career. It is advisable that the school nurse should be fond of children and have infinite patience. There are many openings, as must be obvious from what has been said in the preceding pages, but in dealing with children, there is more than usual to be done in the way of pioneering and in imparting knowledge.

Aims of the School Nurse.—No matter how she may be employed—as orthopaedic special nurse, as physiotherapist, in sanatorium or in blind school, in day nursery or as ordinary nurse in an ordinary school—the school nurse can do much, not only in the alleviation of suffering but in the education of the children. Her main subjects will be those of healthy minds, healthy bodies and healthy living, and in this trio are comprised lectures on cleanliness, sanitation, good habits, food and so on; practical demonstrations of exercises and encouragement of physical training; sex education if need be.

Vocational Guidance

Lastly a few words may be said about the “leaver.” All the time a normal child has been at school his general physical and mental constitution has been under observation, as his Medical Record Card will testify. Part 4, which deals with vocational guidance, was mentioned in passing on p. 410; it is now possible to examine this part and to assess its usefulness. The doctor and headmaster or headmistress, after consultation with other teachers, school nurses and perhaps psychologists, will as a rule confer in the filling up of the card and will supply the information as follows.

Data on Card.—The following data are on the card under 4—Vocational Guidance. Child unsuitable for:

Severe manual work.

Sedentary occupation.

Exposure to bad weather.

Work in a dusty or damp atmosphere.

Work near moving machinery or moving vehicles.

Work involving prolonged standing; much walking; quick movement from place to place.

Work causing eye-strain.

Work requiring acute distance vision.

Work requiring acute hearing.

Occupations requiring manipulative skill.

Certain occupations on account of defective colour vision.

On the above a line is drawn through the item which does not refer to the child; thus if all the data are obliterated, the child is fit for general employment. Under the Factory Act of 1937, the examining surgeon concerned may, and does, make use of the school medical card. Apart from information provided on the Medical Record Card, more detailed particulars may be verbally given in cases in which there is an official Juvenile Employment Officer appointed by the education authority to consult about leavers with teachers, school medical staff, examining surgeons, employers and others who are concerned in ensuring that the square peg is not driven into the round hole.

CHAPTER 6

TUBERCULOSIS

GENERAL SURVEY. IMPORTANT DATA. GENERAL SCHEME OF TUBERCULOSIS CONTROL. ROUTINE OF INVESTIGATION. THE TUBERCULOSIS CLINIC. GROUPING. SANATORIUM TREATMENT. HOSPITALS. THE IMPROVED PATIENT. AFTER-CARE OF TUBERCULOSIS PATIENTS. VILLAGE SETTLEMENTS. MAINTENANCE OF THE TUBERCULOUS SUBJECT. ESTABLISHMENT AND STAFFING OF SANATORIA. HOSPITAL ACCOMMODATION. GENERAL EQUIPMENT AND STAFFING.

ONE of the most important problems to be solved by the hygienist—if, indeed, not the most important—is that of tuberculosis. Tuberculosis is a gnarled old oak in the forest of medicine. It has resisted all the storms of therapeutics, including even those of the sulphonamides and penicillin. Already in this work we have seen how deeply fixed are its roots and how tough are its branches; we have noted how much it has dwarfed other growth, and how difficult to cut down are its main boughs. Nevertheless, the main object of modern therapy—to fell this great tree and remove its roots—is still as it has always been, and now with the science of social medicine and of hygiology expanding rapidly, we may yet see the trunk lying on the ground and the roots blown up and disposed of.

The opportunity now presents itself to make a general survey of tuberculosis from the public health point of view, and not so much, as in other sections of this work, to study the clinical aspects. The administrative and sociological side of tuberculosis refers to the general and special efforts now being made on a broad basis to bring tuberculosis under complete control. The State is very much alive to the threats associated with the prevalence of this disease, and politicians have done a great deal by passing various Acts of Parliament which have as their motive the control and regulation of all varieties of the tuberculosis process.

General Survey

In this chapter much is omitted with regard to tuberculosis because of the fact that many aspects have necessarily been

surveyed in previous Sections, and also because at this stage it has to be assumed that the nurse is well acquainted with the elementary facts of the disease, and with its lesions in the human subject, as well as with the bacteriology and the clinical treatment. Every nurse indeed should have a sound understanding of the various ways in which tuberculosis expresses itself. The time has come to sum up the main points of the present situation.

Important Data.—The antiquity of tuberculosis is great; it has existed for at least 4,000 years. The cause in man is the human or bovine type; neither the tuberculosis of birds nor that of the fishes affects the human being. Although only 5 cases in every 100 of all deaths from tuberculosis in England and Wales are due to the bovine type, nevertheless one quarter of the deaths of children under the age of 15 are caused by it—a very important factor indeed. Deaths from tuberculosis in England and Wales amount annually to about 25,000; the new cases reported every year total about 60,000, but there is a fallacy here, for about 10 per cent of the cases are not notified, therefore it would be more correct to put the total down at nearly 70,000. Tuberculosis in all forms is responsible for about 5 per cent of the deaths of the British people. Probably the most alarming data of all refer to the early age of death. Such wastage of young lives is a real threat to any community or State; tuberculosis being notifiable, it is possible to give reliable statistics showing that 25 per cent of primary notification refers to persons of the age group 15 to 25; well over one-third of those who die from tuberculosis do so between the ages of 25 and 45, i.e. in the prime of life. Phthisis, or lung infection, is more common among women up to the age of 25, after which men die more commonly than do women from pulmonary disease. So far as bone and gland tuberculosis are concerned, the greatest incidence is in the first 5 years of life, after which there is a steady and very substantial fall in the numbers of persons who die. Tuberculosis is to be found all over the world; it is less prevalent in places in which the air is pure (e.g. Switzerland). Europe cannot be said to be promising at the present time; before World War II there were evidences of some grip being obtained by the antagonists of tuberculosis, but in 1941 there were clear evidences of the halt in the decline, and today many of the poorer areas in various countries are very much affected by this disease. So far as causes are concerned, the ideal environment for the start and spread of the disease would seem to be the overcrowded, dirty, sunless 2-roomed house; the victims are the underfed and those who live under conditions of poverty. It is not possible to associate tuberculosis with certain specific occupations, although as already stated elsewhere the disease is fostered by any conditions which

put undue strain on the organism and demand excessive response from its defensive mechanisms. Despite the exacerbation in some parts of the world, it must not be forgotten that about 80 years ago it was about 6 times greater in incidence than it was in 1941, when it had fallen to about .7 per 1,000. There is no doubt that many comprehensive influences have been at the root of this decline—general and natural immunization as a result of constant exposure to small numbers or attenuated types of bacillus (sub-infective immunization), eradication of the more virulent strains and so on. It is impossible to assess the value of modern hygienic living, but the general effect of improvements in all directions, socially and industrially, is obvious. Food, and especially milk, is supervised very strictly, and undoubtedly the decline in the cases of bone and gland tuberculosis is directly associated with this.

General Scheme of Tuberculosis Control

It is clear that tuberculosis by its very nature is a community and a national problem, and, therefore, expert opinion and reliable advice given by the medical profession to the State would be expected to give rise to a repercussion among legislators to the maximal degree which would cause efforts to be made in every direction to search for, treat, supervise, control and ultimately stamp out the disease. Today we see the fight against tuberculosis in full action.

Routine of Investigation.—It will be remembered that tuberculosis may manifest itself in various forms, including phthisis of the lung, meningitis, surgical tuberculosis of the bones, joints and glands, peritonitis, laryngitis and lupus (of the skin). In every case there are rules laid down for guidance of those affected, and of the skilled persons in attendance. Let us briefly pass in review the procedure as it obtains today; the scheme has been evolved after many years of trial and error, and in its construction many eminent persons, medical and lay, have taken part. It might be truthfully said that the cream of medical ideas has been preserved in the pattern that is to be seen today.

The family doctor or the out-patient physician, but more often the former, may be the first to recognize the disease. In the case of pulmonary tuberculosis, those living with the patient may have noted signs such as pallor, loss of weight, short cough and various other evidences, and suspicion may have been aroused, but it is well to recognise that tuberculosis (generally referred to as "consumption") is first in the minds of many laymen, and there is what is termed by the psychologist a conditioned reflex among the public to this disease. However, whether the diagnosis be positive or not, and apart from any suspicions in the doctor's

mind, in any case of loss of weight and debility, some decision must be reached without delay as to the presence or absence of the tubercle bacillus. Various procedures may be quickly gone through, thanks to the diagnostic resources of the public health department of the district, which maintains a special staff in order to deal with tuberculosis, and has a tuberculosis officer and trained nurses. In the first place the tuberculosis officer may be asked to see the patient in a consultative capacity; secondly, the bacteriological laboratory over which he presides may be able to clinch the diagnosis by finding the tubercle bacillus in the sputum. The doctor in charge of the case must notify all forms of tuberculosis coming within his care, so that the tuberculosis officer not only learns from his laboratory, but also from the medical officer of health, to whom the disease is reported, that a new case of tuberculosis is to be added to the list.

The Tuberculosis Clinic.—When notification has been given to the M.O.H. of the occurrence, the tuberculosis officer will almost certainly get in touch with the patient's doctor and the patient himself, for it is the duty of the tuberculosis officer to make available to the patient every possible diagnostic and therapeutic measure known to be useful in the disease. Depending upon the patient's circumstances, treatment may be offered at home, but for many it will be necessary to attend regularly at a tuberculosis clinic. The latter may be in a building by itself, or it may form part of the building in which the maternity and child welfare centre is established. Formerly referred to as the dispensary, the tuberculosis clinic has become one of the main stations for control of the disease. Assuming then that the patient has begun attendance at the clinic, the first duty of the medical staff there is to carry out a meticulous examination, the details of which are carefully recorded and filed in a card index. At all clinics of any importance, facilities exist for microscopical and x-ray examination at intervals, and mass miniature radiography may also be available. The result of this vital investigation is that the tuberculosis officer, with all his experience and skill, is able to plan the treatment and to advise the patient as to its main essentials. Generally the initial examination determines the category or group into which the patient is to be put. As a rule, also, arrangements are made with regard to examination and supervision of contacts.

Grouping.—A plan has been drawn up by the Ministry of Health with regard to grouping of tuberculosis. First it has to be established whether or not there is any tuberculosis; those who do not show any definite signs are referred to as T.B. In the case of those with positive signs (referred to as T.B.+) 3 main groups are determined as follows: Group I—very few physical signs and little or no constitutional defect; Group III—the bad cases, with

signs considered to be dangerous, and with outlook consequently bad; Group II—those not in the other two groups. From time to time patients in these categories may be reviewed and the class altered.

Sanatorium Treatment.—The tuberculosis officer or his deputy has to come to a decision whether or not the patient is an ambulant case or a bed case, and whether he should be allowed to remain at home in bed or be sent to a hospital or sanatorium. Needless to say, the general trend of opinion is that the sanatorium should be the place for any satisfactory observation and treatment required. For in an institution such as this, in which expert staffs work, and in which every conceivable instrument or apparatus or therapeutic measure is to be found, and in which the diet and discipline are planned especially for the disease, surely the patient must have the best chance to make a good recovery. The main principles of sanatorium treatment are not merely the belief in abundance of fresh air; there is the dietetic side of the treatment and the measures that add to the defensive forces; there is the physiotherapeutic influence that ensures that the patient will have a certain amount of muscular exercise dependent upon his condition; there is the enforced rest that allows the lung to continue any healing process with the least disturbance. No one can think of a sanatorium without thinking also of the induction of artificial pneumothorax and of the x-ray department. Artificial pneumothorax has already been discussed, but here reference may be made to the constant checking of the lungs that goes on in the sanatorium and the supervision exercised over those who may be sent home for a few weeks at a time, and who call at intervals at the sanatorium to have refills of air or of nitrogen on the affected side, and so benefit by having the lung kept absolutely at rest. Nowadays pneumoperitoneum may be effected instead; its benefits are obvious in carefully selected cases. Thoracoplasty, or the removal of portions of several ribs so that the chest wall may sag and cause permanent shrinkage and collapse of the affected lung, has a long history, but it is still very useful in certain types of case. If the case be one of lupus, carefully supervised treatment with the use of the more modern gold therapy may have good results, although great care has to be taken in using gold preparations intravenously since they are apt to set up very serious reactions. Otherwise lupus may be dealt with by exposure to the Finsen light, now almost of historic interest but still of good effect.

Early Cases.—It is customary, and certainly advisable, to arrange that all early cases should be brought together and treated in a special sanatorium. Here everybody is optimistic, there is a greater measure of gaiety; light work, occupational therapy and suitable recreations pass the time speedily; there are no chronics

and no moribund cases to spread depression. The graduated programme allows for slow but certain building up of the constitution, and as in all other places dealing with tuberculosis, there are ample facilities for x-ray and other examination to gauge the progress being made.

Domiciliary Cases.—Reference was made above to the possibilities of treatment at home, but it is well recognized that expense is one of the greatest drawbacks. It is difficult to carry out all the strict sanatorium measures in the bedroom of a house, no matter how well organized the regime may be. It must be kept in mind that tuberculosis is an infective disease, and that a fine balance has to be established between personal wishes of the patient and safety of the public from the disease. The essentials in any house are that it should be big enough to allow provision of a good room for the patient, who should be segregated to a certain extent, with his own crockery and cutlery, and with satisfactory sanitary equipment. The tuberculosis nurse will generally attend regularly, and will see that the usual precautions are taken. Spitting, of course, is the great danger; every person treated at home must be instructed in the proper use of the modern sputum mug. So far as medical attendance is concerned, the National Health Service applies here; the doctor will be enabled to order, in addition to the usual drugs and appliances, various special foods.

Hospitals.—The provision made for cripple children has already been referred to (Chapter 5). Since most of the bone and joint diseases are tuberculous in origin, hospitals specializing in surgical tuberculosis are very necessary. One of the great pioneers of treatment of tuberculosis in children was Sir Henry Gauvain, whose name is associated with the Lord Mayor Treloar Hospital, at Alton, and with the seaside branch at Hayling Island. Sunshine, and later on sea bathing and fresh sea air, were proved to be of great value in convalescence and many children have been benefited by the work done at this hospital. In all hospitals of similar type, the lay-out is based on the pavilion system, with covered passages to the wards. Ample glass space exists in all wards and construction is such that the maximal amount of air can be admitted if need be. Orthopaedic appliances of up-to-date construction and of great variety are available, and everything is done to make the constitutional and local resistance greater towards the T.B. The number of cripple children is now very much reduced, and apart from the good effects of early diagnosis and satisfactory hygienic measures, undoubtedly modern treatment of surgical tuberculosis continues to bring excellent results. This is all the more commendable when it is realized that tuberculosis is not affected in any way by sulphonamides or penicillin, and streptomycin is distinctly limited in its application.

The Improved Patient.—Considering the pulmonary case once more, particularly with regard to the sanatorium patient who has improved, there is a great field for useful work by the tuberculosis specialist. Patients discharged from hospitals, sanatoriums or from the clinic as ordinary active cases, nevertheless require to have subsequent supervisory treatment. The custom among tuberculosis officers is to grade those who have had successful treatment in several categories, these categories appearing on the books of the clinic, to which the majority of improved patients go, as recovered, arrested or quiescent cases. The absolute standard of success is, as might be expected, the recovered case; to merit this label, the patient must have been quite free from all symptoms for at least 3 years. With regard to the other 2 groups the guarded way in which the terms are applied shows that the experts are very unwilling to let the tuberculosis patient stray far from the fold. At the clinic as already stated, a forum exists for all types of tuberculosis sufferers. The clinic has all appliances, including the "refill machine" for artificial pneumothorax, so that the patient may be saved a trip to the sanatorium in order to have such treatment carried out.

Once the improved patient is considered to be fit to do some work he can be graded according to systems devised locally if need be, but the fundamental of such grading is that the patient is asked to some job which he can do, and which cannot do his lung any harm. At sanatoria such occupational therapy is the rule, especially in the case of those likely to become recovered cases; occupational therapy is the means to the end—a rehabilitation step. Eventually the patient may be said to be "cured" if, indeed, this term can ever be applied to the tuberculous patient.

After-Care of Tuberculosis Patients

No matter how well the ex-sanatorium patient may feel, he or she is wise to submit to periodical examination by the specialist. For this reason the majority of cured persons, alive as they are to the benefits of the modern system, choose to be guided by their advisers. As mentioned above, after-care is always obtainable at the clinic, but apart from this, the patient just discharged from the sanatorium may be helped in many ways by taking advantage of the almoners' service, and by continuing courses of rehabilitation or preparation for the occupation suggested as suitable.

Village Settlements.—This is one of the greatest ideas ever put into practice. The pioneers had much vision and in the establishments at Papworth and at Preston Hall (the latter run by the British Legion) ordinary domestic life goes on and the patient works at a job approved as suitable for him at a central

workshop, so that for all practical purposes the normal course of life is pursued. The limitations, which might properly be styled benefits, are that there are not many settlements, that the work is of a certain type and that there are moral obligations with regard to reporting sickness or the smallest evidences of activity in the lung. In these settlements every thought has been given to the continuance of the sanatorium conditions, in that houses, as well as workshops, are very airy and that culture as well as craftsmanship is encouraged (art, music, literature). These schemes do not pretend to be self-supporting, but they are morally effective in stabilizing a man's mind and giving him the satisfaction of knowing that he is fully employed. A further benefit is provided by the industrial colony in that any person who has become permanently disabled by the disease, so that he can do only very light work, can be kept under constant observation by the medical authorities who help very prominently in the running of such settlements; thus, after-care is assured. Another aspect of the village settlement is that medical supervision of the family is much more active than it would be under ordinary living conditions. Doctors keep the children under observation almost from the day of their birth, and are thus able to deal promptly with the early tuberculous lesion, whatever it may be; more especially, however, is the onset of tuberculosis prevented by such watchfulness. The proof of this is to be found in the records of any of the settlements, the number of cases of tuberculosis in children being very small indeed. Mass miniature radiography, already mentioned at various points in this work, is especially useful in village settlements, in which speedy reviews of all chests may be advisable from time to time.

Maintenance of the Tuberculous Subject.—It has been mentioned above that in most cases the ex-sanatorium patient is not quite a complete economic unit—that is to say, he or she may be able to earn a certain amount, but it is not the full amount that would be earned had the patient been free from tuberculosis. There is therefore a handicap, and as it would be a policy of disaster to allow the ex-sanatorium patient to take up work that would only aggravate the condition and perhaps accelerate the return of the active disease, special allowances are made to those who are partially or totally incapacitated and who might be made very much worse in health by the anxieties with regard to economics which would inevitably arise in the absence of some financial support. The method of payment is simple; every person who is under treatment at home, in the sanatorium or other institution or as a clinic out-patient, and who accepts the advice and direction of the tuberculosis officer, may be financially assisted, as follows.

Maintenance Allowance.—In this allowance provision is made for

the patient and his wife or for the wife with dependent husband; a weekly sum of 39 shillings is payable. Single persons get 27 shillings weekly. There are various allowances made for children and in certain special cases, all of which are carefully considered. There are extra allowances for rent and winter fuel. When the patient has to go to live in any institution, 10 shillings is deducted from the weekly allowance.

Discretionary Allowance.—The local authority is sympathetic to the tuberculosis patient and a very generous attitude is shown to the person who may be in difficulties, a sum of 10 shillings a week (maximum) being available for tuberculous subjects who may have life insurance premiums to pay, school fees to find for their children, instalments to send for goods bought on the hire purchase system, and so on.

Special Payments.—In the case of special payments, the patient may be in hospital some distance from home and may want to see relatives; train and bus fares may be paid in such circumstances. When the mother of a family has to go to the sanatorium, and it is necessary for the husband to obtain some kind of domestic assistance, the wages of the temporary helper may be paid by the local authority. Single persons without any relatives or dependents may be granted 5 shillings weekly as pocket money.

Establishment and Staffing of Sanatoria

Since tuberculosis is a dangerous disease and since it is obviously one which cannot be properly attacked without ample forces—money, accommodation, appliances, doctors, nurses, additional allowances—the community has already accepted the full responsibility and has accordingly expended large amounts of money on the fight against the disease.

Hospital Accommodation.—This may be studied fairly closely, since it is a very important subject, especially so far as the nurse is concerned. As a general rule the number of beds required for all tuberculous cases in a district is calculated on a basis of so many years' average, but according to Currie and Mearns a simple method of calculation is to allow one bed for every annual death from tuberculosis occurring in the area to which the service applies. Three out of every 4 beds will be required for phthisis pulmonalis (pulmonary tuberculosis, consumption) cases, thus 25 per cent of the cases will be tuberculosis of bones, joints, glands and so on; The sanatorium may exist as a sanatorium proper, i.e. the patients would all be ambulant; in this case a separate hospital for seriously affected patients who are bedridden would be necessary. The general tendency nowadays, however, is to centralize all the tuberculosis cases in one institution, to which hospital cases and sanatorium cases are both sent.

The purely sanatorium type of patient is accommodated in a ward with perhaps 20 beds; this ward is merely used as a dormitory. On the other hand, for the bed cases small wards may suffice, with a certain number of cubicles in addition. The method of putting patients out in chalets and other garden shelters is not so popular as it was at one time; the benefits of small chalets are that shelter can be provided from the prevailing wind or constant exposure brought about to the sun, by merely rotating the house on its swivel.

General Equipment and Staffing.—A sanatorium requires plenty of atmosphere; for every 5 patients there should be an acre of ground at least. Wards are more than usually well provided with means of ventilation, with floor space, with window space and with measures for easy removal of dust. Sterilization of sputa and of sputum mugs is provided for. In addition to the special sanatorium equipment (e.g. for artificial pneumothorax, and so on), the usual x-ray installation, physiotherapy department and surgical amenities are to be found. Ample bathing and washing facilities should exist for the patients, and the latter should have satisfactory dining room accommodation. With regard to nursing staff, the general allowance is 1 nurse for every 4 patients.

CHAPTER 7

VENEREAL DISEASES

HISTORY. PARLIAMENTARY ACTION. ORGANIZATION OF
VENEREAL DISEASES CLINICS. STATISTICS. NOTIFICATION.
WORK AT THE CLINIC. TRAVELLERS. DEFAULTERS. THE
SOCIAL ASPECT OF VENEREAL DISEASE. PROPHYLAXIS.
PREVENTION.

WHEREAS the hygienic and the clinical features of venereal disease have been discussed already in this work, the public health and sociological aspects have not been fully examined. In the following pages various important matters are dealt with, these referring chiefly to the regulations in force to control venereal diseases generally.

History

Syphilis came from the New World to the Old in 1493, Christopher Columbus and his crew bringing it back from America (where it was rife) when they landed at Barcelona. Since then syphilis has found its way into almost every other part of the world, and especially Europe. Gonorrhoea was known in the days of Moses. Thus the antiquity of venereal disease is established, and this very fact gives the explanation why the doctor's battle has been so hard.

There is no need to stress the dreadful effects of syphilis or of gonorrhoea here; we have learned enough of their depredations to know that they demand eradication *quam primum*. Despite all that was done and hoped for by doctors through the centuries, there was little to show for their labours and certainly there was no fall in the incidence of venereal disease. It is interesting and important to know that a great world war awakened the people to the significance of venereal disease and caused them to take certain action through their legislative assemblies. In this chapter only the British problem is discussed but it is of quite sufficient proportion to be regarded as applicable to all nations.

Parliamentary Action.—In the early part of the twentieth century statistics (such as they were) with regard to venereal disease began to cause some reaction, not only among the members of the medical profession, but among the public. Perhaps it was

the historic discovery of the spirochaete by Schaudinn in 1905, or the announcement of the preparation of arsenic called salvarsan (606) which was produced by Ehrlich after 605 unsuccessful attempts to find the remedy and which was given great publicity, that made the people think more about venereal disease and the possibilities of cure and even prevention, but no doubt the remnants of ill-advised Victorian prudery forced restraint on them, and so progress was slow. However, in 1915, just after the beginning of World War I, a Royal Commission was set up and various recommendations were made by it. Very soon afterwards, local authorities began to organize centres at which treatment and advice to sufferers could be given under conditions of privacy. But, up to 1940, no great effort was made on a national scale to tell the people of the dangers of venereal disease, how to prevent its occurrence and how to deal with the lesions in existence.

Acts and Regulations.—The Venereal Diseases Regulations 1916 gave local authorities powers under 4 headings as follows: 1. to set up laboratories or to make arrangements for the examination of suspected venereal matter (discharge, scrapings, blood) sent for diagnosis by doctors; 2. to plan for hospital or other clinics to which sufferers from venereal disease might be sent for treatment (free) applied under conditions of secrecy; 3. to provide antivenereal drugs, especially arsenicals, for doctors' special use in their own practices; 4. to run publicity campaigns. Schemes devised on these lines had to be approved by the Minister of Health.

The second important step taken by the politicians was the passing of a Bill that became the Venereal Disease Act of 1917. This Act states that when there is in operation within any specified district the free treatment scheme described above, it is an offence for a person other than a qualified medical man or woman to treat venereal disease. Another part of the Act states that any unqualified person who advertises that he is prepared to treat venereal disease or in any way causes an announcement to be made to the same effect may be punished for the offence.

The next regulation to be considered is the very well-known and important one, published under the Defence (General) regulations of 1939, as Regulation 33B. For the first time compulsion was mentioned, but with certain limitations. This regulation had reference to the common dangers of what is termed the "contact." The procedure was as follows: certain qualified practitioners were ordered to write in confidence to the local M.O.H., giving information with regard to any person who was under suspicion as a transmitter of venereal disease. The name and address had to be given in this letter. In the case of the prostitute, for instance, who might have been a source

of infection for several men, it is assumed that when the latter attended for treatment at the special clinic or elsewhere, they would all give the name of a particular woman as the transmitter. Now it is obvious that this type of woman was not taking the trouble to have treatment, and the object of Regulation 33B was to force her to be treated by a venereal diseases specialist. When the M.O.H. reviewed the letters received and examined the statistics thus obtained, he knew at once where the danger lay. He was, therefore, given power to act when he heard from 2 or more sources that a certain woman was suspected as being the transmitter of venereal disease. He notified the contact that she must attend at a certain time and at a certain place in order that she might be examined by a specialist. The latter might, indeed, fail to discover any sign of venereal disease, and if so it was his duty to forward to the M.O.H. a clearance certificate for the woman in question. But if the specialist should have discovered any kind of venereal disease, a special notice—the “treatment notice”—had to be put into the hands of the contact, who had to understand what it meant, viz. that she had to attend at his clinic or rooms and do as she was told with regard to treatment until he could give her a certificate to say that she was not suffering from a *communicable* form of venereal disease. Severe penalties were mentioned in the Act for non-compliance.

Regulation 33B was introduced for the first time in November 1942. After a year's trial it was found that only one man and 77 women had disobeyed orders to attend and had had to be served with notices; 543 attended as a result of a warning given. When the figures for venereal disease are analysed (see later), it is obvious that those given above represent the merest trifle in the way of contacts, and it was not surprising that Regulation 33B was withdrawn at the end of 1947. This regulation failed to check the incidence of venereal disease.

Organization of Venereal Diseases Clinics

First let us try to get some idea of the incidence of syphilis, gonorrhoea and soft chancre at the present time. These figures refer to England and Wales. Venereal disease is not notifiable, except when it appears as ophthalmia neonatorum; the figures, therefore, represent only a part of the total number of cases, but they will be illustrative and informative of the extent of the task ahead. The only data available come from the special free clinics, but obviously there must be thousands of cases which do not come under the specialist's eye at the free clinic, for example, those who go privately to a doctor or those who may get over the acute stage quickly and imagine they are cured. Furthermore, the use of sulphonamides and penicillin, especially the latter, has

brought excellent results, but of course this means that more victims will have treatment privately and that greater risks will be taken, for there is no question that gonorrhoea at any rate is speedily cured by penicillin.

Statistics.—A conservative estimate of the numbers of new cases of gonorrhoea and syphilis per year puts the figure at 12,000 for syphilis and 75,000 for gonorrhoea. Soft sore may account for 1,200 cases, therefore we may take the figure for venereal disease as being not less than 85,000 new cases per year. This is a terrible situation, with the possibility of spread of venereal disease to 1 in 20 of the population. But it must be remembered that treatment is very effective and that about 80 per cent of those who report to have venereal disease treated attend the special clinics described in the paragraph which follows. Even if we assume that the remaining 20 per cent attend doctors privately, however, we are still left with the enigma of the number of people who do not know they have venereal disease. This need not give rise to any wonderment, for it is well known that the initial symptoms of gonorrhoea and of syphilis need not necessarily be very marked, and it is impossible to say how many persons who become infected with the gonococcus or with the spirochaete are unaware of the infection. Alternatively, if they should be aware of it, they may be possessed of such good fighting elements in the blood that they overcome the attack in a few days and become free of any symptoms or signs and forget all about the incident. One other point should be mentioned, and it is well known to the general practitioner; a good proportion of the female patients in the ordinary round of general practice may have leucorrhoea; this is an unsatisfactory diagnosis at best, and even although the cause may be the non-venereal organism, *Trichomonas vaginalis*, in the majority, a certain proportion of these conditions are actually gonorrhoeal infections. How many cases of the latter type do not reach the doctor? And how many may last for a day or two and clear up with the use of homely remedies such as antiseptic douches?

It would be interesting to examine the statistics of the direct sequelae of primary venereal disease and by analysis find out how many there are with gonorrhoeal arthritis and other secondary lesions of gonorrhoea, or with secondary or even tertiary syphilis, who cannot recall having had primary sores or discharges, or who can remember the passing incident of the primary condition but yet state that they overcame the attack unaided, with the minimum of discomfort and the minimum of treatment. Knowing as we do the many manifestations of syphilis, the various patterns of the secondary and tertiary stages, the length of time that may elapse until the tertiary stage becomes evident, it must be quite clear to all who think carefully that much venereal

disease is still in existence all around us and that ignorance of its presence is the rule in many cases. Reliable figures are not always obtainable, but in wartime circumstances, certain compulsory investigations can be carried out, especially so far as soldiers are concerned. One of the most striking sets of figures ever to be published concerned the intake of recruits for the United States Army in the years 1940-1. More than 2,000,000 recruits or conscripts were examined, and of these more than 9 in every 200 gave positive blood tests for syphilis; furthermore among the small group of negro soldiers, actually 27.2 per cent were discovered to be syphilitic by blood test. It is well to remember that these figures concern laboratory tests of a certain type, and it is possible that so many more actually had some kind of venereal trouble, but there was no reaction to the test applied. What has been stated in this paragraph, therefore, may be regarded as a warning signal of the composite figure that may soon be arrived at and which will be the true reckoning of the incidence in its every form of the elusive venereal disease.

Notification.—Medical practitioners, specialists and others concerned with the success of the existing schemes of control and treatment, still continue to urge the need for compulsory notification. Those in favour of it point for instance, to the success of the Swedish plan, which began as an experiment and which became compulsory by law. In Sweden it is an offence not to report the case but the law goes further and states that unless the diagnosis be followed by appropriate treatment, agreed by all to be the logical sequel, the person with the disease may be punished. And if a person under treatment should stop his attendances before he has been officially pronounced free from venereal disease of any kind, he is liable to be fined. Not all authorities approve of the scheme of compulsory notification, however. A small proportion disapprove because they believe that compulsory notification causes people to dodge the law and conceal their condition. The answer to this is that in 20 years the Swedish method altered the incidence of acquired syphilis from 4.3 per 100,000 to 1 per 100,000 of the population.

Work at the Clinic.—Venereal clinics were not easy to establish and there are always certain difficulties in running them. The public does not like the idea of publicity, and resists all arguments based on hygiene and figures. As might be expected, the most successful clinics are those established in the large hospitals as unobtrusive annexes of the out-patient department. The V.D. patients, male and female, may use the common entrance and so avoid being seen actually going into the clinic; there is no doubt that this is a very important factor in encouraging patients to attend. Some clinics are for men only and some for women only; some have a men's department and a women's

department, but with separate entrances; in others, again, the men attend at certain hours and the women at different hours. The last is not suitable when there is a big industrial population. It must be agreed that experience at a London hospital clinic with a large average attendance shows how well such clinics may be conducted. Equipment is modern and efficient and attendants and nurses are experienced and capable; there is no better example to be seen of the right way to tackle the venereal disease problem. It must be appreciated, however, that the local authority has very often an uphill battle to fight, and local conditions and lack of the best type of premises do not encourage patients to call for advice. Nevertheless, as mentioned earlier in this chapter, more than 80 per cent of V.D. patients are dealt with at the clinics. So far as children are concerned, it is customary to deal with congenital syphilis at the clinics reserved for women. The staffing is generally arranged by the M.O.H., acting under the direction of the local authority, which determines the extent of supply of personnel and money. As a rule a male and a female venereal diseases officer are appointed, and various assistants—young doctors gaining experience perhaps—give valuable help. The benefits of a good male and female nursing staff have already been mentioned; in the venereal clinics nurses with special training and experience may be appointed, and, like all other public health nurses, they are under the direction of the local health department.

Equipment and Adjuncts.—A V.D. clinic would be useless without a laboratory. The latter, however, need not be at the clinic, but may be in a central building and may, indeed, be part of a laboratory carrying out ordinary routine investigation of microscopical or biochemical type. Here Wassermann and other tests may be done and examination made of any material suspected as being of venereal origin. In a side room at the clinic, however, the doctor in charge will, no doubt, have a microscope as well as a few bottles of stain, for in cases of gonorrhoea it is often necessary to examine a smear while the patient waits. The larger clinics have equipment such as the urethroscope and other electrical appliances; small surgical operations may be performed and diathermy used in various ways. Irrigation apparatus may also be provided, and some clinics are equipped with special compartments for this purpose.

Diagnosis and Treatment.—With regard to syphilis, as mentioned elsewhere in this work the organism (spirochaete) may be recognised by dark-ground illumination of the microscopical field; the material may be obtained by scraping the surface of the chancre, by puncturing a swollen gland or by removing a flake from the secondary rash, it being always kept in mind that presence of blood interferes with the examination. The 2 main

tests are the Wassermann test and the Kahn test, but a more recent test, the Meinicke clarification test, gives a strongly positive or strongly negative result, so that it is easy to read. As is well known, each of these 3 tests are used for the examination of the patient's blood or spinal fluid. In the treatment of syphilis the following are used: 1. arsenicals (neokharsivan; "Novarsenobillon"; "Acetylarsan"; arsphenamine; tryparsamide—for neurosyphilis); 2. bismuth salts (metallic bismuth); 3. penicillin in early cases; 4. potassium iodide; 5. mercury; 6. special drugs in particular cases and for particular lesions.

So far as gonorrhoea is concerned, diagnosis is easy in the smear obtained from the urethra in the male or the cervix in the female, simple staining methods demonstrating the presence of the double kidney-shaped organisms within the leucocytes. Other tests may be carried out by using cultures or a complement fixation test. The treatment of gonorrhoea has been revolutionized since the successful introduction of penicillin, and developments take place so rapidly that it is difficult to keep pace with the progress made. The sulphonamides—especially sulphathiazole and sulphadiazine—may still be used as well as the other methods of pre-penicillin days, but from the many reports received penicillin appears to dissipate the disease in less than a day. As a rule there are 2 good methods from which the choice of treatment may be made. The first is the single-dose method already referred to in this work, viz. 200,000 Oxford units in arachis oil and beeswax; the second consists of 2-hourly intramuscular injections of 30,000 Oxford units until the patient has been given a total of 5. As will be evident from what has been said already in this chapter, the term, cure, must not be used because the patient says he is well and because there are no signs. Women especially require to be kept under observation for some months and it is customary and advisable to make tests every month for 3 months before certificates can be given of complete cure. In the case of males it may be necessary to take smears from the urethra, prostate gland and rectum; a urethroscopical examination carefully made will disclose whether or not the lining membrane is still affected.

Travellers.—The difficulties of providing treatment for persons who are travellers or seamen or for any others who find it impossible to attend the clinic regularly are overcome by the issue of what is known as Form V. 15 (revised). This is a personal card, issued to persons in the category referred to above, and on it are recorded the town and place of every treatment and the reference number of the traveller on the local register. The clinic doctor is asked to write on the card the name of the appropriate clinic (with hours of consultation and so on) of the next port or town to be visited by the patient. Thus all assistance

is given, and there can be no excuse for not making use of the treatment centres during the course of any journey or voyage.

There is one other noteworthy point. In the case of a person who lives in an area in which there is not any clinic and who has to go to a local centre for treatment, but under the auspices of a different local authority, claim may be made for travelling allowances, these to be paid by the local authority of the area in which the patient resides.

Defaulters.—All who are acquainted with the working of a V.D. clinic know that it is very difficult to persuade patients to keep up their attendances. Many of these patients are young people of both sexes, and it is quite understandable why they become impatient and despondent at the slow rate of cure. But it is absolutely essential that they should go on to the end, for until they are given the clearance certificate they are liable to infect others. Various schemes have been put in operation to try to persuade patients to return—sending reminders by post, or getting in touch with the patient's private doctor and asking him to have a talk with the defaulter and find out his reasons for not attending regularly.

The Social Aspect of Venereal Disease

Prophylaxis.—This subject should be dealt with realistically and frankly. Ethical standards need not be discussed here, but it is interesting to note that whereas one large group of the public is tolerant of any measure that will prevent venereal disease, apart from abstention from sexual intercourse, the other is shocked at the idea and holds itself aloof from any measure that would allow such licence. Unfortunately it is not possible to psycho-analyse all members of the community and so no reasoned explanation can be given for this deep cleft in public opinion, but the fact is that in the combatant forces in many countries, the commanding officers have reached the conclusion that mind cannot always keep a hold on matter, and thus according to location and belief, various preventative appliances are issued to troops before they go out of barracks or camp, and at the medical inspection departments various types of apparatus for urethral cleansing, supervised by a trained orderly, are available in the evenings when the men return, to be used after sexual intercourse has taken place. It has been proved that incidence of venereal disease has been much reduced by such methods. The serviceman's privileges, however, do not appear to be applicable to the civilian. The situation is that the number attending the clinics on account of syphilis (fresh cases) has more than doubled itself. The present campaign against venereal disease seeks to prevent such occurrence by appealing to the honourable instincts of the

people. Various investigations have been carried out, and many facts about prostitution, sexual hygiene, psychological abnormality and so on have been made freely available to the public. It is believed that among other things the strengthening of the family ties and the return to the family ideals will ensure that home and its influences for good will check many of the unstable motives of those who expose themselves (and others) to venereal disease. This is a very pious philosophy and worthy of complete success, but it should be understood that the way back is rough and uneven and there is no short cut. Much of the success of a campaign on the above basis depends upon community strength and collaboration, with a lead given pre-eminently by the medical authorities, since to the majority the venereal disease question is not one so much of ethical behaviour as one of health. Most people today understand biology, therefore logical explanations on these lines are likely to have good effect. Social medicine has actually a big field here; if future generations are to be strong and hearty in the fashion of their ancestors, everything must be done to remove all the vicious elements from parenthood. The people themselves must recognize what standards are required with regard to sexual conduct and must accept such standards willingly, must fight for them and must not desert them. Obviously a big struggle is ahead to put the house in order, and in that struggle, every man and woman, the doctors, the clergymen, the social workers, must strive hard to make the big effort. What has been done already is nothing as compared with what must be ahead of us. Propaganda by lectures, films, leaflets and books, not to mention posters displayed in public places, is likely to do more good than harm, but again such propaganda cannot run the risk of being weak. If faith does not return to the heart of every man and every woman, there will be no fundamental change in existing thought, and our only commentary must then be: "Alas for future generations." To build up that faith or philosophy, and to reorientate the principles of any race must take some time, and the adoption of a new regime does not only mean the education of youth by paid instruction or their management by leaders of social clubs—it means in effect the setting of the sublime example by the mother and father, and once that is accomplished there need be no fear of the rest.

Prevention.—A few concluding remarks may be made on the subject of prevention. This term is not used to describe preventative treatment, which should always be considered in association with birth control founded on hygienic principles and if need be supervised medically. Prevention refers to the discovery by testing for unsuspected venereal disease, chiefly syphilis, and subsequent treatment. To give an example: many young men and women, wishing to make certain that neither they nor their

spouses nor their offspring should have any venereal taint, submit to various tests—blood examinations and the like—and there is no doubt that it gives a satisfactory feeling to have the knowledge that the foundations of the family unit are sound. In the event of the occurrence of positive reactions to tests, the individual concerned, always assuming that he or she is honourable, would disclose the information and either put off the marriage or at least agree that marriage should not take place until unassailable medical evidence should be produced that there is no residual venereal disease. In some parts of Canada there is compulsory examination and blood-testing for all who want to marry, and in the United States of America, certain States have adopted rules on the above principles. Some go still farther and demand that every pregnant woman should be tested by the Wassermann reaction, and if the latter be positive, antisyphilitic treatment and various other precautions have to be taken.

CHAPTER 8

MENTAL DEFICIENCY*

THE MENTAL DEFECTIVE. DEFINITION. GRADING. ASCERTAINMENT. DIAGNOSIS. INFANTS AND YOUNG CHILDREN. CHILDREN OF SCHOOL AGE. THE ADULT. INTELLIGENCE TESTS. AETIOLOGY. INHERITANCE. ENVIRONMENT. SIGNS AND SYMPTOMS. IDIOCY. IMBECILITY. FEEBLE-MINDEDNESS. MORAL IMBECILES. CLINICAL TYPES. AMAUROTIC FAMILY IDIOCY. CRETINISM. MONGOLISM. HYDROCEPHALUS. MICROCEPHALY. EPILOIA. PARALYSIS. EPILEPSY. SYPHILIS. INFLAMMATION. CONTROL AND TREATMENT OF MENTAL DEFECTIVES. CONTROL. TREATMENT.

It is quite a common experience to hear the layman (and sometimes the nurse, too) speak of terms such as idiocy, lunacy, imbecility and mental deficiency, without having any accurate knowledge of what they all mean. The result is that for many these terms have lost their proper significance. It would be well to recognize the fact, therefore, that for very important reasons, which will be evident as this chapter proceeds, abnormal mental conditions mentioned above, and the many others, are distinct and are recognized as such by the law. The requirements for the Certificate in General Nursing of the General Nursing Council are, so far as the social aspect of disease is concerned, a good knowledge of the fundamentals of mental deficiency, and of the management of those who are in this abnormal state of mind; accordingly, although various other mental states and diseases may be mentioned in passing, there is no need to go very far beyond the scope of the syllabus. Nurses are aware, of course, that there is a special Certificate granted by the General Nursing Council for England and Wales for those who qualify for, and pass the examinations in, Mental Defective Nursing, but it is not possible in this work to discuss the subject as fully as it is discussed in the companion work to the present one—*Modern Mental Nursing*. We must, therefore, be content to learn the fundamentals of mental deficiency and to gain a fair elementary knowledge of its medical, nursing, legal and social aspects.

* See Note on page 456.

The Mental Defective

The first part of the study of mental deficiency must concern the organism itself, so that a clear understanding may be obtained of the methods of dealing with the patient and with his environment.

Definition.—The legal definition of mental defectiveness is contained in the Mental Deficiency Act of 1927, which is an amending Act applicable to England and Wales, based on the original Act of 1913. For all practical purposes reference may be made to the 1927 Act only; when information is given with regard to any other Act relative to the condition, the fact will be mentioned.

Before the legal definition may be given, however, some preliminary facts must be stated with regard to mental disease in general. There are, unfortunately, different schools of classification, but so far as Great Britain is concerned there are 2 divisions of mental abnormality into which the various diseases may be grouped; these are 1. mental deficiency, which is a juvenile disease and associated with weak intellect and poor morality, and 2. lunacy, which includes the other types of mental abnormality and which is associated with the adult life. Very little need be said about the second group in this chapter, since it need not concern us except as a background of the main subject under discussion.

The Act states that mental defectiveness is "a condition of arrested or incomplete development of mind existing before the age of 18 years, whether arising from inherent causes or induced by disease or injury." Every word in this definition must be given its full weight; every consideration of mental deficiency must be made on the basis of this clear statement. Mental deficiency is also known as amentia or oligophrenia. The age limit of 18 is quite arbitrary, since younger persons may be certified as suffering from any mental disorder, but the important point in this definition is that the disease is apparent before the development of the mind is complete. From what has been said above it is fairly obvious that mental deficiency encompasses many different states but the fundamental is that all coming within its scope have imperfectly developed minds, and thus are to be distinguished from the purely lunatic cases.

Grading.—The number of mental defectives in Great Britain is about 400,000, and there are over half a million school-children who are not able to be educated with children of their own age and therefore have to be accommodated in special schools. In an attempt to make some classification of this great mass of people, experts have established 4 grades, these being

mentioned in the Act as idiots, imbeciles, feeble-minded and moral imbeciles.

Idiots.—An idiot is described in the Act as being “so deeply defective in mind from birth, or from an early age, as to be unable to guard himself against common physical dangers.”

Imbeciles.—The imbecile may be regarded as being in a category which is recognizably above that of the idiot, although he is incapable, as the Act has it, “of managing himself or his affairs.” Imbecile children cannot be taught to take any responsibility whatsoever.

The Feeble-minded.—In the United States of America the homologue of the feeble-minded is the moron, a word which has crept into the literature and which appears to be there for good. In America all mental defectives are referred to as being feeble-minded. So far as the term, feeble-mindedness, applies to Great Britain, the Act states among other things that a feeble-minded person is one of a category of “persons in whose case there exists from birth or from an early age mental defectiveness not amounting to imbecility, yet so pronounced that they require care, supervision, and control for their protection or for the protection of others, or, in the case of children, that they by reason of such defectiveness appear to be permanently incapable of receiving instruction from ordinary schools.” It is fairly certain from this definition alone that the feeble-minded must constitute a very big category.

Moral Imbeciles.—The qualification for this category, which is sometimes termed the moral defectives, is that it comprises “persons who from an early age display some permanent mental defect coupled with strong vicious or criminal propensities on which punishment has had little or no deterrent effect.” Here, it may be agreed, is the most difficult category.

Application.—The above grading is used merely to get some order into the chaos, and does not necessarily have any reference to the clinical aspects of any specific case; it is, indeed, an entirely social type of classification. The usefulness of such grading is shown when disposal and management of the mentally defective are under consideration. Idiots and imbeciles are generally brought to the doctor by the parents or guardians, and disposal is governed by the law and by the above classification. So far as the remaining grades are concerned, all patients under 21 years of age automatically come under the provisions of the Act. Those above this age who are feeble-minded or morally imbecile, and who on account of such defects are a nuisance or a danger or generally anti-social, must be certified in the usual way under the Lunacy Act. Lastly there is provision made for any persons in the 4 groups who are “neglected, abandoned, without visible support, or cruelly treated,” as well as for those committed to an

approved industrial school, habitual drunkards, and in certain circumstances children referred by the education committee of the local authority (see later).

Ascertainment.—In view of the large annual additions to the total of mental defectives, it is necessary to have an understanding of the system of ascertainment. The onus is on the local authority to ascertain which members of the population are mentally defective, and thus to be controlled according to the provisions of the Mental Deficiency Act. Furthermore, these persons must be adequately dealt with. Doctors, parents, guardians and school-teachers are all expected to give assistance. The main procedures are considered below.

Diagnosis

All procedures having any connexion with the mind are always very slow in their action; the human being is very shy of anything mentally abnormal, especially when he sees it in his own offspring. The diagnosis of mental abnormality may not be in any doubt so far as the expert is concerned, but in every case, since the State may step in and control the patient, there must not be any misinterpretation of the law and consequent denial of rights to the citizen. It is almost certain to be the case that in 99 cases out of 100 the parent or guardian will be glad to take advantage of the Act, but there may be the remaining one case in which opposition will be encountered. Most doctors will be ready to vouch for the fact that the imbecile child, for instance, is very often loved and shielded by its mother to an almost unbelievable degree. A brief outline of the procedure in regard to children of various ages may be helpful to the nurse.

Infants and Young Children.—Let us review first the situation in children up to the school age of 5 years. In infancy various physical signs of abnormality and of hereditary defect may be obvious, but the medical practitioner learns to be guarded in his prognosis, for experience shows that improvement is possible, and this is one reason why parents and guardians are encouraged to persevere with mentally afflicted children in their early years. It is true that certain tests can be applied (see later), but these are not of much use when it is evident that the child is making some progress. The main guides to both doctor and mother, however, will always be those associated with the emotions and the behaviour. When the organism does not respond to its environment, or if so with general disinterestedness and apathy, and when there is incontinence of urine and faeces, despite all efforts to establish control, the parents begin to realize that the child is unusual.

Later on, they note that the child is not in any way interested in toys or other objects that most children would eagerly handle; they find that no desire exists on the part of the child to say words or even to utter sounds; they cannot persuade the child to make efforts to stand upright, far less to walk. By the time the child is 3 years of age the parents envisage that a big task faces them, and yet in many instances they will not be convinced that they are struggling with a case of mental deficiency, but continue to make great sacrifices, not only on their own part; they tend to upset the household generally, and maybe enforce unfair treatment on other children in the house. When the patient approaches the age of 5, and when the parents are met with the obligation of enrolling their child at a school, the climax is reached. On investigation by the expert, it will probably be discovered that in addition to the shortcomings described as belonging to the earlier years, there have been later developments of want of concentration, aimless movements, great urge to destroy things, complete impossibility of control and a very aggressive attitude towards all living things, human and otherwise, in the neighbourhood. Such a child obviously requires constant attention and does not belong properly to a family circle.

Children of School Age.—As mentioned later, the local education authority may discover that a certain child is mentally deficient before it is of school age, but assuming that the child comes under observation for the first time when it is incumbent on the parents to send him or her to school, the great problem for all concerned, but especially doctor and teacher, is: "Can this child be educated?" As mentioned already, the obvious imbecile or idiot cannot be educated in any way, but the special school may benefit the feeble-minded, and the dull or backward may be dealt with as described in Chapter 5. Much depends upon the employment of intelligence tests, described later. It must always be remembered that injury or result of injury, or physical defect, deafness, blindness and so on, may add to educational difficulties and may complicate the process of grading; in such cases trials may be arranged in special schools or by expert psychiatrists.

The Adult.—In the case of the adult (although nowadays it is rarely the case that anyone far above school age has escaped the net of the various authorities representing State control), the diagnosis is made on careful deliberation of the signs and symptoms displayed and the definition of mental defectiveness given in the Act. Thus, destitute persons may be discovered to be mental defectives; misdemeanours may land the defective in the hands of the police; friends may bring the patient to the notice of the doctor. In such cases a reason will probably be

found for late discovery of defect, except in those who may have had encephalitis, for example, or an unusual strain on the mentality at adolescence which brought the defectiveness into relief. Many disorders of conduct which become anti-social only because the individual concerned has grown up and has clashes with the police outside instead of with his parents at home, have not been brought to light because of protection and concealment, and general toleration inside the family circle. When these cases are concerned it is almost invariably found that the boy or girl has been a very naughty child indeed.

Intelligence Tests.—Since this is not a work on psychology, and since it is not necessary for nurses in the ordinary routine of general nursing to have to assist at such tests, a mere outline is given below of the work that is being done increasingly in assessments of the standard of intelligence by putting the child through a certain kind of examination. There are many critics of such tests, but this can be said of them: they were proved to be of use in the Services in World War II, and were extensively used in selecting people for certain jobs. Most sceptical persons are bound to make some admission of their success. As each child is an individual, however, it must have idiosyncrasies, and, therefore, any complete generalization of factors cannot be made. Before reviewing the scope of intelligence tests, let us agree that they need not be applied to the idiot or the imbecile. They are of great use, however, in determining the limits of the borderline case, and being completely objective, are not difficult of interpretation.

Uses.—In summing up the uses of intelligence tests, no more concise pronouncement has been made than that of Leslie Cook, who states in the *British Encyclopaedia of Medical Practice* that they assist in diagnosis and in giving a concise and universally understood picture of the degree of defect; that they indicate what type of education or training is likely to be most beneficial; that they measure progress over a period; that they help in deciding whether abnormal traits are due to backwardness, inattention, predilective inabilities, neurosis or psychosis; and that they are useful for research purposes, e.g. comparison of the intelligence of various races, types of amentia, and social classes.

Types of Test.—The main tests now in use are the individual intelligence tests, the group intelligence tests, educational tests, special aptitude tests, sensorimotor tests, and personality tests; there are many others, but references to them must be sought in other works.

So far as the individual intelligence tests are concerned, these were first devised by the French workers Binet and Simon, but

many others have come into the field and have framed new schemes or altered or added to the original tests—Stanford, Burt, Gesell, Merrill, Palmer, Terman, Stutsman, Spearman, Drever, Collins, Penrose, Raven, Cattell and many others. The individual tests make a check of ordinary natural intelligence and thus refer to powers of reasoning, to memory, to amount of perceptive power, and so on. In the Spearman method, the conception fundamentally held is that ability of any human being consists of what is termed a “massive factor,” referred to as “g.” Added to “g,” however, there may be certain special proficiencies or peculiar aptitudes, which Spearman refers to as “s.” Any assessment, therefore, concerns “g” and “s.” In these tests it has been proved that “g” (native intelligence) becomes increasingly augmented as time goes on, but that it makes little advance after the age of 15. The other factors (s) are in a different category, and demand a different set of tests. These tests may be *viva-voce* or written; in the case of the latter, special forms have been devised with printed headings. For the youngest children the tests are modified, but taking the method as a whole, it is such that unless the child be much below normal standards the tasks set will be accomplished. From these tests the mental age may be deduced, this being defined as the time at which a normal child would pass certain tests; the child, younger or older, who can pass the tests belonging to this specific age category, nevertheless, is given the mental age attached to it. For example, if a child of actually 8 years of age can pass the tests supposed to be done by a child of 10, the mental age of that child of 8 is 10.

Intelligence Quotient.—This term has been used freely, and is commonly referred to by those who do, and those who do not, know its full meaning, as I.Q. It is defined as the mental age divided by the actual age and multiplied by 100. Thus, if a child be bright and active and obviously far ahead of those of its own age, so that although the actual age is 10, the mental

age is 14, the I.Q. would be $\frac{14}{10} \times 100$, or 140. On the other

hand the dull and laggard child might have a mental age of 7 and an actual age of 10, in which case the I.Q. would be

$\frac{7}{10} \times 100$, or 70.

In carrying out intelligence tests to find the I.Q., the examiner is entitled to choose the type of test which in his opinion would bring out the most accurate information with regard to intelligence; usually there is a time limit for each question. There are also special adjustments for adults, the

time age of 14 being the limit. With regard to results, the general standards of I.Q. are accepted as indicating the following conditions: 1. 70 to 75, doubtful, and certainly on the border line; 2. 75, normal; 3. 90 to 110, good intelligence, applicable to most normal people; 110 upwards, supernormal. These figures should be ascertained by taking the mean of several test "scores."

For persons who are illiterate, deaf, or unable to speak the language of the place in which the tests are held, certain performance tests have been devised, these relying on apparatus. For instance, sets of blocks of wood to be fitted into certain spaces on a board, may be used, and there is Porteous's maze test also, in which the child is asked to trace a line through different printed mazes.

Group Intelligence Tests.—For children above the age of 10, group tests may be found to be very easy and useful. In these tests, speed of answer, as well as accuracy, are the main factors.

Educational Tests.—As much objection and destructive criticism was associated with the original simple education tests, in which the amount of learning acquired by the child was the object, reformation in educational tests has been brought about. These tests are based on standard "norms," and according to age, a child is expected to be able to read and spell and do arithmetic of a certain standard. Each age group has a standard pattern or quality—e.g. so far as writing and drawing are concerned—intrinsic to it, and the degree of approximation to such pattern determines the score.

Aetiology

The aetiology of mental deficiency may be considered under two main headings: 1. inheritance; 2. environment.

Inheritance.—To understand fully how the mentally defective infant is conceived and born, it is necessary to pass in review the whole story of fertilization and primary cell division, including the work done by the chromosomes and the theories of Gregor Mendel. Even although the last may now be subject to strict review, the fact will surely remain that transmission of traits cannot be denied. So far as primary amentia is concerned, the germ plasm is invariably at fault; in the event of one or both parents having mental taints, the strong possibility is that their progeny will be defective, perhaps merely susceptible to mental or nervous disorder, but more likely to have a frank deficiency. There is no question of the pattern of insanity persisting through the generations, but the basic want is there, and the types developed thereon may have varying characteristics. Mental deficiency is persistent; it is very difficult to eradicate;

it appears to feed itself because the mentally deficient man or woman is generally licentious and vicious—for instance, so far as alcohol and sex are concerned. Another cause of mental deficiency is marriage between near relatives. When cousins marry, for example, and have offspring, the latter often accumulate the defects of their parents and ancestors. Lastly, in hereditary influences we have to consider the offspring of the very young or the very old, and when mental deficiency is observed in these children we at once think of the germ plasma and realize that it may be immature or in a state of decay; it is essential that the germ plasma should be mature.

Environment.—With regard to the second aspect of the aetiology, the question may be put: "What external influences help to create a state of mental deficiency in an apparently normal child?" Much depends upon the environment, but it can never be said that hereditary influences can be ruled out of court. It is true that in certain circumstances a child may grow up quite normal to observers, but it cannot be denied that there is a proclivity to mental instability, and it only requires a pull on the trigger or some accident or other strain to make the child abnormal. This has been proved, for instance, during periods of war.

Accidents.—There are many possibilities of accident in the ante-natal period, as reference to Section XII will prove. The ordeal of birth may also bring many potential dangers, as is well known. Leaving these two aside, we must examine the factors in the environment of the child up to the age of 18 in order to find out how mental deficiency may be accentuated by conditions of life. With regard to health, cerebral disease comes first on the list; concussion, contusion, cerebral haemorrhage, meningitis, toxæmia are but a few examples. General constitutional diseases may also be added. Psychological conditions need not be considered at the moment, since mental deficiency is purely and simply a defect of the intellect.

Signs and Symptoms

In enumerating the signs and symptoms of amentia, the great field to be covered becomes clear to the imagination. There are general signs and symptoms peculiar to the grade of mental deficiency under consideration, stigmata of degeneration, fits, convulsions, difficulties of speech, hearing and sight, uncontrolled movements and many other manifestations. It is impossible to give more than the fundamental characteristics of each group.

Idiocy.—Early recognition is easy. There is generally paralysis or some other bodily defect. Fits may be recurrent. With increase of age the backwardness of the child becomes

more and more apparent. It does not try to talk or walk. If by chance walking be accomplished, it is done in a clumsy, often extraordinary fashion and with great difficulty. The child looks and behaves more like an animal than a human being, primitive urges such as hunger causing him to snatch and gobble his food and make a mess all round him in the process. The idiot has no idea of being clean or of keeping himself clean; he therefore requires to be constantly watched. Often there is incontinence of bowel and bladder, but even if there be partial control the idiot will resort to excretion just when he is so minded to do so and without warning. All idiot children are quarrelsome and undisciplined, and resistance to control may often be physically demonstrated. The mental age is rarely above that of 2 years. The resistance is poor, disease is easily contracted and fertility rate is low.

Imbecility.—The imbeciles form a group much bigger than the above; for some reason imbeciles are commoner in the country than in the town. The imbecile has the instincts of self-preservation and is aware of dangers. But there is no question of there being any possibility of education even as a low-grade wage-earner; the imbecile does not therefore come within the economic plan. It is true that certain simple tasks can be performed under supervision, but the expense involved often rules work out. The heavy gait and attitude are typical. Intelligence is almost nil: monosyllabic words (go, cow, hat, dog) may be recognized and repeated imperfectly. The mental age is roughly 3 to 7.

Feeble-Mindedness.—The ratio of feeble-minded persons in the country to those of similar type in the town is as 8:5. In studying the feeble-minded it becomes clear that difficulties are on the increase, for often there are no stigmata of degeneration, and conduct is not necessarily anti-social. Work done, however, is of the simplest character, and education does not proceed very far. The mental age is about 12. One of the characteristics of the feeble-minded is that they do not persevere at their jobs for long; they keep moving about from one place to another. In the majority of cases the feeble-minded cannot compete with men or women of their own age and type and in the end some occupation is found which is not too exacting and which is not very highly paid. It should never be forgotten that anti-social members of the community may persuade the feeble-minded to become their accomplices, thus crime is often associated with this group of mental defectives, and the police may often be the first to bring the patient to the doctor's notice. It should be noted that certain rare types (known to the French as *idiots savants*) may become very proficient at a certain restricted occupation involving fine mechanical work.

Moral Imbeciles.—Persons in this category give the most trouble to society, because of their general instability and their lack of emotional balance. The terms, emotional instability, and moral deficiency, have been applied to this type, as well as the term used at the head of the paragraph, but Henderson and Gillespie appear to have come nearest to success in comprehensive description in the adoption of the term, psychopathic personality, to cover the whole group. The psychopathic personality is clearly apart from the simple defectives mentioned in the above intellectually-deficient groups, and the difficulties of diagnosis, classification and treatment are accentuated by the moral and emotional deficiency. As in all other cases, the nearer we approach the normal the more complex and less easy does the situation become.

General Features.—As already mentioned earlier in this Chapter, the psychopathic personality is characterized by domestic crises; the parents agree that the child has always been "a bit mad" or "difficult". Tantrums, sudden boiling up of fierce temper, with uncontrolled violence, want of orthodoxy in numerous ways, general anti-social conduct, unreliability, delinquency, and in the end addiction to alcohol or drugs or both, sexual excess and crime—that is the career of the moral imbecile. The criminal aspects vary from petty pilfering to resort to confidence tricks, from betting and gambling illegally to writing begging letters. In this group we must include all the kleptomaniacs, the pyromaniacs, the consistent liars and so on. Many people of so-called complete sanity may even recognize in their own blameless lives some tags which might well belong to the psychopathic personality. For example the pathological liar is represented among human beings in many degrees, but only those of psychopathic personality develop into swindlers, and thus convince themselves at last as they have always wished to do that they are actually what they pretended to be. This is the truth generally behind the "sensational financial crash" of the evening papers. Other groups of psychopathic personality type are those known as pseudo-querulants—aggressive people, always looking for trouble and generally getting into it; there are also the eccentrics—generally harmless people; finally sexual delinquency may be associated with the group.

Clinical Types

Only a few short notes may be made about the clinical types, many of which have already been referred to in this work.

Amaurotic Family Idiocy.—In this disease, which commonly affects children of Jewish parents, the infant may not show any evidences until it reaches the age of 4 months, when

the movements of the eyes are affected. Optic nerve atrophy, with blindness, subsequent paralysis of the limbs and signs of idiocy soon follow and death generally occurs at the age of 2.

Cretinism.—This condition has been mentioned already in this work, and is caused by thyroid defect; 3 groups of cretins are distinguished, ranging from that consisting of the idiots to that known as the cretinoid group, in which only certain symptoms of cretinism appear, and in which the degree of mental deficiency is in conformity with the amount of lack of thyroid secretion available.

Mongolism.—This is a very common condition as compared with other examples of mental deficiency. The picture must be familiar to all nurses. The name is applied because of the resemblance of the child to the Mongolian. As far as can be ascertained, heredity has a small part to play, and mongolism has been shown not to be associated with alcohol, tuberculosis, endocrine insufficiency or syphilis in the parents. The head is small and round; the narrowness of the eye openings draws attention to the child, and on close observation it will be found that there is squint and sometimes nystagmus; the tongue is thick and there are fissures on the surface. The attitude is one of disinterestedness, the mouth often gaping and the nose running. The hair is dry and brittle as a rule. The circulation is bad, so that frostbite and chilblains are common. The mental deficiency varies, but the mental age is usually 4 to 7. There is a 50 per cent mortality before the age of 5.

Hydrocephalus.—This has also been discussed. The massive head needs no further description; sometimes there is a hare-lip or a spinal defect. Death may be expected in the first year and almost certainly before the child reaches the age of 2. The mental state is one of imbecility.

Microcephaly.—In this condition the smallness of the skull bones is accentuated by the recession of the forehead and of the lower jaw. The nose is thus very prominent—said to be like a bird's beak. There is great wrinkling of the skin of the head. Half of the microcephalics are also epileptics and imbecility is the grade most to be seen.

Epiloia.—In this condition the mental defect is very great. The skin of the face shows marked dermatitis. Post-mortem examination generally demonstrates renal tumour and small neoplasms of the cerebral surface.

Paralysis.—Birth palsy may be accompanied later on by some degree of mental deficiency; the same may be said of accidental injury to the head, involving the brain.

Epilepsy.—Idiocy or imbecility in the epileptic child is common, but it is difficult to say which is there first—the epilepsy or

the imbecility. It is quite certain, however, that mental development may be hindered by the existence of epilepsy. Children in this category are often violent and bad tempered and cannot be managed easily at home.

Syphilis.—A syphilitic child tends to become delinquent as he grows up. The general physique is poor. The child is backward at school.

Inflammation.—The function of the brain may be affected because of some general toxæmia, e.g. that of typhoid fever or of pneumonia, or it may be that local infection, such as that caused by the meningococcus, may be the cause of mental defect. In the event of recovery from these cerebral attacks it may be noted that the character of the child has changed; the permanent damage to the cerebral cells often depends upon the degree of toxæmia and the length of the illness, but so far as mental reactions are concerned, these need not be directly proportional to the physical injury. The picture is usually one of general disobedience, wilfulness, lack of discipline, bad temper, destructiveness and a hooligan tendency.

Sensory Loss.—The work now done for the blind and the deaf, as well as for other children with lack of full sensory powers, has already been discussed, and all that need be added is that with proper education and training such children may become good citizens. Treatment of the blind and the deaf is now at such a good state of efficiency that it is hardly necessary to consider the congenitally blind or deaf among the mentally defective.

Control and Treatment of Mental Defectives

A very brief review having been made of the "material" of mental deficiency, the subject now arises regarding the disposal of that material and management of the various grades of defective so that as little interference as possible may be caused to the community and to the domestic circle, and so that these unfortunate members of society may be treated with all humanity.

Control.—Various points with regard to the discovery and management of cases of mental deficiency in children were raised in an earlier part of this chapter, but these referred to diagnosis only. It is time now to review the various Acts referring to the mentally defective person, and to see how their provisions can be translated into reasonable action. The powers of the local education committee are such that in the case of any child over 2 years of age, when there is any doubt as to the possibility of educating it by the ordinary methods, it is in order for the committee (which acts through the local authority) to send a notice to the parents, saying that the child must be examined by the

medical officer of the school authority and asking that suitable arrangements may be made. As in the case of other school examinations, the parents are given an opportunity of being present at the examination, the date, time and place of which will have been sent to them in reasonable time. Any parent responsible for a child in this category who does not accede to the request or who ignores the notice and cannot give a satisfactory reason for his or her action, may be summarily convicted and fined. The next stage (assuming that wisdom prevails in the parent's mind) is the report on the child. The medical officer makes his examination and sends the confidential report to the local education committee; this report and any others—e.g. from teachers—are carefully considered. Then, if the local committee should decide that the child is suffering "from a disability of mind of such a nature as to make him incapable of receiving education at school," the procedure under the Mental Deficiency Act of 1913 is that this committee should inform the local authority accordingly. Meantime, however, it is incumbent on the local education committee to inform the parents of its intentions, and a period of 14 clear days must be allowed to elapse from the sending of this information to the parent until the date of the dispatch of the report to the local authority. In this fortnight, the parents have the chance of communicating with the Minister of Education if need be, and of making any objections with regard to the issue of the report; when they exercise their rights in this respect, the law states that only by the Minister's direction can the report be issued. In connexion with the above, the decision may be arrived at whether or not the child in question is suitable for joining a class of mentally deficient children, and especially whether its presence in the class will affect them detrimentally or not, or whether the child itself will suffer because of the presence of other children.

With regard to children of school age, the Acts apply also to those between the ages of 7 and 16, and it is one of the duties of the education authority of the district to compile a list of all such children who are below the usual mental standards. According to the Acts, the local authority looks after these children by setting up a Mental Deficiency Committee, the latter being given powers of "supervision, guardianship, accommodation and training" for mental defectives. The duty of this committee is, in fact, to take charge of all mental defectives of school age, to sort them into their proper categories and to ensure that they are provided with the best conditions for themselves and for the rest of the community. It was mentioned in Chapter 5 that special educational and institutional facilities are provided.

Education.—The problem of education resolves itself into 2 main divisions. The decision has to be arrived at 1. whether

the child of school age, although unsuitable for ordinary or even "backward" schools, can be educated within certain limits; 2. whether the child is, in fact, a hopeless case so far as learning is concerned.

With regard to the first category, which includes the feeble-minded, the education committee must first obtain a medical certificate so that the child may be sent to one of the special schools; the latter as a rule take in the child as a boarder and special training is begun; so far as day schools are concerned, certain schools of this type are able to take children up to the age of 13, but naturally the question of economics does not enter into the picture here, for each child requires to be given individual study. Later on the children may be given vocational training elsewhere. Only simple tasks can be accomplished, and on the education side all that can be expected is that the child will be taught to keep himself clean and in good hygienic condition, and how to exercise his muscles; he will also be given lessons in simple English, chiefly how to use words and sentences.

In the second group, a different medical certificate is required, this stating that the child is not likely to benefit in any way from even the most elementary system of education. This certificate is sent to the local authority, which as a rule will recommend admission to the institution as the solution, but it is also possible to put the mental defective of this type into the care of a guardian, or to provide some means of supervision in the child's own home.

Lastly, it will be understood that the supervision of the mental defective does not end when school age has been passed. Under the Education Act of 1944, any child deemed to be in need of further care and supervision is examined; a report is sent to the local authority to say that the child has a mental disablement and cannot be freed from the need of supervision. This report is also sent to the child's parent or guardian.

Adults.—At the beginning of the present chapter various factors were mentioned which were instrumental in reaching a diagnosis of adult mental deficiency. We may expand our review a little more here and examine the legal aspect. As already stated mental defectives are generally supervised after they leave school, or its equivalent, but various adults may for certain reasons be missed, or the mental deficiency may not have been fully demonstrated. As a rule in the case of idiots and imbeciles, 2 medical certificates are required when it is expedient to place anyone of these categories in a certified institution. The parent makes the application and sends 1. a certificate by a general practitioner (generally one who has been in attendance on the patient); 2. a certificate given by a nominee of the Board of Control or the local authority. Both these certificates are made out on special forms. This method applies to feeble-minded persons

under 21 years of age, but there must be a third certificate from a judicial authority, i.e. the consent of the Court must be obtained. In all cases of feeble-mindedness and moral imbecility (psychopathic personality), judicial authority is essential before the patient may be taken from his or her home and put into an institution or under guardianship. The procedure varies according to the case under consideration, but as a rule either the patient makes the application or the Court may apply the Act to those who appear before it as law-breakers, or the Home Secretary may make an order with regard to criminal lunatics. In every case a petition has to be presented to a judge of the County Court, or a magistrate specially qualified. The usual 2 medical certificates must be put in and the expression "subject to be dealt with" under the appropriate Acts must be used in the accompanying statutory declaration. A very important provision of the Act is one to the effect that unless 1. the person concerned has been found neglected or wandering, or without visible means of support, or 2. alleged to be in need of care that cannot be given at home, or 3. as prisoner in Court, has been found guilty of an offence of criminal type or has been deemed suitable for sending to an industrial school, or 4. is a lunatic, or 5. a habitual drunkard, or 6. (in the case of women) has become the mother of an illegitimate child while in receipt of poor relief, or is pregnant and unmarried and in receipt of poor relief, the phrase "subject to be dealt with" does not apply. That is to say, in every case in which it is proposed to take the action described above, one of the 6 factors must be proved as being in existence. An additional measure with regard to the sending of school children to institutions has been mentioned in the previous paragraph. When the judge or other authority has granted the Order, the patient may be dealt with.

Treatment.—Very little remains to be said about treatment, since in the consideration of the methods of control, disposal, education and so on have been discussed, and in the case of the mental defective these may well be regarded as therapeutic measures. Needless to say, there will be every attention paid to the general physical condition, and to any disease present. It is agreed that the average mental defective of adult age is not an asset, but a liability to the community, but on the assumption that some achievement is better than none, occupational therapy, however difficult its application may be, is successful, if for nothing else than that it uses up positively what mental output there may be. The cerebral function that is lacking cannot be provided; what has to be done is to make the best of a bad job, and apart from those who are completely incapable of having any freedom without careful supervision in an institution, there is satisfaction in the thought that despite all the handi-

caps of mental deficiency, modern principles have at least succeeded in giving the patient the maximal amount of participation in human affairs.

The Psychopathic Personality.—Unfortunately, the members of the 4th class—the so-called moral imbeciles—must always provide society with its most difficult problems. The trouble here is that the incompetent brain cells do too much, or regarded in another light, that their function is perverted. The aim should be to remove if possible the stigma of the term, moral imbecile. In present-day circumstances much can undoubtedly be done by psychoanalysis, companionship, good guidance, frequent review and reassessment and general supervision. The chief difficulty in these cases is that we see the end of the story rather than the beginning; the convicted criminal is the result of a long and weary career of misdeeds which has terminated in the grand climax, which to sane eyes is always inevitable. What is effectively necessary is early discovery and concentration on treatment before the cumulative process starts. For this reason the present-day methods of discovery of the mental deficient in the cradle, so to speak, brings hope that the next generation will see less of the delinquent. That we acknowledge the difficulties and sympathize with the patient is enough to encourage us to persevere in even the most trying cases.

Note.—Mental deficiency has been dealt with in the new Section (V in Vol. II) on Psychology. It was inevitable that there should be some duplication of matter in these 2 chapters, but the former deals with the subject from the psychiatrist's point of view and the present one from the point of view of the sanitarian; in the varying circumstances of her work, the nurse may have to view it from either of these.

CHAPTER 9

HEALTH AND THE CITIZEN

PUBLIC EDUCATION IN HEALTH. CENTRAL COUNCIL FOR HEALTH EDUCATION. METHODS. LECTURES. NEWSPAPERS. LEAFLETS. POSTERS. FILMS. BROADCASTING. SCHOOLS. SOCIAL SERVICES AND PUBLIC AGENCIES. THE WORK OF THE ALMONER. TRAINING. DUTIES. SOCIAL INSURANCE. VOLUNTARY INSURANCE. COMPULSORY INSURANCE. BENEFITS. FAMILY ALLOWANCES. QUALIFICATION FOR BENEFIT. PUBLIC ASSISTANCE. FUNCTIONS. ASSISTANCE IN THE HOME. THE PUBLIC ASSISTANCE INSTITUTION. VOLUNTARY ORGANIZATIONS. CHARITY AND ITS APPLICATION. THE FUTURE. THE NEW PATTERN OF HEALTH SERVICE. DEVELOPMENT. NATIONAL INSURANCE ACT, 1946. GENERAL PROVISIONS. CONTRIBUTIONS. BENEFITS. NOTES. NATIONAL INSURANCE (INDUSTRIAL INJURIES) ACT, 1946. WEEKLY CONTRIBUTIONS. QUALIFYING FACTORS FOR BENEFIT. PAYMENTS. INDUSTRIAL DISEASES. NATIONAL HEALTH SERVICE ACT, 1946. STRUCTURE. HOSPITAL SERVICES. GENERAL MEDICAL SERVICES. LOCAL HEALTH AUTHORITIES. MENTAL HEALTH SERVICES. THE MEDICAL PRACTITIONER. NURSES. MATERNITY SERVICES. THE HEALTH CENTRE. PRIVATE PRACTICE. MISCELLANEOUS PROVISIONS OF THE ACT.

To have a healthy heritage, to live happily, to maintain health and to die of old age may be said to be the ideal of most human beings. In the present Section considerable analysis has been made of various subjects, and all have had some connexion with health and its maintenance or with the attainment of the maximal degree of health in conditions in which the absolute is impossible. Now it is time to consolidate our knowledge and to review the field of health as it may be viewed today. Many provisions exist for health betterment and for compensation when health breaks down, temporarily or permanently; the State now interests itself to a substantial extent in the hygienic welfare of the people, and although at present the accent appears to be on health improvement rather than on health achievement, there is a growing awareness among the population of the rewards which await those who plan their lives so as to defeat disease and thus prevent the mental, physical and economic discomforts associated with

it. Positive health is the aim of social medicine, but the latter is in its infancy and the former is for most people not yet possible. It may take several decades until the present socio-medical legislation has its full effect, but the general trend of the people is towards a more natural and more healthful way of living.

In the following pages a general review of the situation so far as health is concerned is made—not in any considerable detail, it is to be feared, but ample, it is to be hoped, for nurses to have a good comprehensive knowledge of what is happening now and what is likely to happen in the immediate and distant future.

Public Education in Health

Those who live in the present era cannot realize that less than a century ago, medicine was not only struggling to get some foothold after hundreds of years (to be precise from Reformation days) of decadence, but it was a closed book to the general public; the latter were carefully discouraged from learning too much about anatomy, physiology and other medical sciences. The mystery and the autocracy associated with the doctor were universally maintained. Within the past 50 years much change has taken place in the whole conception of medicine, and now the public is ready to learn all it can learn about disease and its cure, but more especially about its prevention. This is as it should be; there is no virtue in being ignorant of the constitution of the body or of the way in which its functions are carried on. What is the best method of giving the facts of medical science to the man in the street? There may be many answers to this question, but all are based on frank explanation of the working of the human machine and the methods of keeping the machine at its maximal efficiency. A health-conscious nation is not judged by the fact that a certain proportion of the men and women make a hobby of all branches of Red Cross work and become proficient in first aid, home nursing, hygiene and so on, or give most of their time to ambulance work and similar pursuits. Nor can a nation be said to be health-conscious because its people read popular medical articles in journals or put popular medical works on their bookshelves. To be worthy of this term, all the nation must have a deeply-rooted belief in health education and systematic study of the body, of hygiene, of physical culture, of disease and its control and indeed of anything that is of interest from a health point of view. How is this to be accomplished? Not only by the action of scattered pioneers; not only by fanatics whose very attitude to health may be unhealthy; not by odd societies or by organizations run by cranks. As in all government some central directing body is needed.

Central Council for Health Education.—Fortunately, for over 20 years there has been a steadily growing organization which has been agreeably accepted as the directing body. This is the Central Council for Health Education. By its propaganda, this Council has done much to make the public as a whole interested in health and mental and bodily welfare. Its aims are simple: to help all local authorities to get on with their work of stamping out epidemics and of spreading the gospel of good health. The two main objects of the Central Council may be quoted:

1. To promote and encourage education and research in the science and art of healthy living and to promote the principles of hygiene and encourage the teaching thereof;

2. To assist and co-ordinate the work of all statutory bodies in carrying out their powers and duties under the Public Health Acts and other statutes referring to the promotion or safeguarding of Public Health, or the prevention or cure of disease in so far as such work comprises health education and propaganda.

In planning a campaign on the above principles, propaganda must be determined on certain fundamentals, these comprising the immediate objective of health education programmes. The Central Council, more than 12 years ago, issued a memorandum which gave these fundamentals as follows: 1. to attract the attention of those not already interested in health and hygiene, and in need of information on the subject; 2. to impart information of the most up-to-date character in the simplest and soundest form to those whose interest has been aroused; 3. to inspire action and change of habit on the basis of the information given.

Despite a decade of war, social disruption, revolution in therapeutics and a hundred and one other changes, the above 3 points still stand out as being admirably suited to the present situation. When acted upon there can be no doubt as to their usefulness.

Organization and Activities.—The Central Council of Health Education (for short, C.C.H.E.) is a very representative body with a medical consultative committee of experts. Government departments, local authorities, professional associations and various societies having a close interest in medicine are represented on the Council. Funds are obtained by subscription, but especially in the form of quotas from local authorities and a grant from the Ministry of Health. The activities include general direction of health propaganda from a central London office (for England and Wales). The country is divided into 12 areas, each with a representative paid by the central office from funds subscribed. The C.C.H.E. also issues books, leaflets, posters and other publications, all underlining the story of good health and

its benefits; these are sold to local authorities at a price which covers expenses of production only and which does not bring any profit to the Council. At the same time, any local authority which makes an annual subscription may have back one-sixth of the value of its subscription in kind or in service, i.e. by supply of literature or of lectures given by experts on health subjects. Apart from these arrangements the C.C.H.E. has a panel of lecturers on various subjects; thus lectures, demonstrations and talks may be given to groups of leaders of health propaganda including teachers, youth leaders and so on. Films are also available.

In 2 other main fields the C.C.H.E. actively assists the Ministry of Health and the local authorities—those of venereal disease information and of diphtheria immunization campaigns. Advertisements for newspapers and journals, posters and leaflets may all be obtained from this body.

Radio propaganda is organized by collaboration between the B.B.C., education officers and medical officers of the Council. In the realms of publication the Council is prominent for its 2 journals, the well-known monthly magazine, *Better Health*, intended for the layman, and the quarterly *Health Education Journal*, which is a more professional journal intended for doctors and those doing active health educational work. In addition to all the above activities, the C.C.H.E. is ready to help with the organization of any scheme to promote better health or with the conduct of a positive campaign to further the cause of hygiene.

In Scotland a similar Scottish Council is equally active, although it began its work only in 1943. The central direction in Edinburgh is in the hands of a representative committee, and it has powers to co-opt others with certain special qualifications. There is not any area organization, the direction being essentially centralized, but the work done is similar to that of the C.C.H.E.

One of the most successful developments of health education has been that of the institution of summer schools. This is a combined operation by both English and Scottish Councils, the aim being to give the educated layman or laywoman a good grounding in subjects such as hygiene, physiology, social medicine and psychology as they apply to the school child. In these courses expert lecturers and university teachers give their services; so many places are reserved in Scotland for English visitors, and a similar arrangement holds good at the English schools. It is clear that there is in this scheme the rapidly developing cell of a great organization that will eventually make the layman qualified to take an important part in health propaganda.

Methods.—In the above paragraphs mention has been made of different ways of spreading the gospel of health by general and personal propaganda, by means of newspapers, magazines, leaf-

lets, posters, lectures, films, radio and by various other methods and media. There are 2 great principles to be considered very carefully by the envoys of health. The first is that nothing is more convincing to the individual seeking knowledge, or more satisfying to the informer, than a personal talk; all other propaganda must take second place, for it has been proved up to the hilt that when a health teacher succeeds in getting a person to sit down and listen, half the battle is over. The second principle is that repetition can never be overdone; the general impression gained by those qualified to judge with regard to knowledge of and carrying out of the main rules of hygiene, for instance, is that housewives are the world's best forgetters. How many times will they read and talk about the healthy home and how many times do they commit flagrant breaches of hygienic law in a day's work? In setting out on the great adventure of instructing the public, therefore, the teacher, the social worker and, indeed, any one seeking to spread the good news, should be ready to tell the same old simple story over and over again, and furthermore to stand up to the cross-questioning inevitable in the circumstances; nobody should be satisfied only with the enthusiasm of the packed village hall, but should be happy to find a queue of private questioners waiting when the lecture is over.

In the following pages brief consideration is made of the special methods in use at the present day, but so far as what might be termed the exhibitionary aspect is concerned, we may dismiss the health exhibition, the health weeks and other concerted demonstrations consisting more or less of groups of the individual items discussed below.

Lectures.—The philosophers and the critics, warm-hearted although they may be, are right in their assertion that it is not the lecture itself that counts but the convincing of the citizen that he should attend the lecture. This is quite true; to fill the lecture hall is to furnish proof that the public is "conditioned" to be told scientific facts, and in most cases to accept them and act upon them. It is obvious to all, especially those who in National Service days were ordered to attend a lecture as a parade, that voluntary attendance is an earnest of the wish of the audience to be taught. This is a very important matter. It is a clear indication that the public has decided that health education is right.

Lectures on health subjects for the layman should always be given by an authority and almost invariably by a medical man or woman, including nurses or others engaged in the medical profession. A great deal depends upon the lecturer, no matter what the subject may be. Simplicity is the keynote; many an excellent subject has been ruined by a surfeit of technical terms and a bad delivery by the lecturer. The latter must be able to speak to the people in their own language, to draw on a wealth

of example and illustration, and to return to first principles over and over again. The facts of the lecture must never be in doubt. A little goes a long way; when yawning starts it is time to think of the peroration. As already mentioned, the heckling after the lecture may be more important than the lecture itself and this part of the programme should be handled with the greatest patience. The lecturer should not show lack of interest even in the most trivial subject; many of the questions put are based on personal experience and the answer means much to the questioner. Another important point is that the public does not like to be treated either as a band of infants, or as a music-hall audience; humour to a degree is of the greatest service but the comic act should never be put on.

Newspapers.—In the first place the newspapers can be of use in connexion with the report of the lecture discussed above; often a chat with the press representative will help the latter to emphasise important points in his report. Otherwise the newspaper offers medical news as it offers other news, and the efficient health propagandist will ensure that at least all that is happening of importance to the public will be brought to the editor's notice. Health education in newspapers and periodicals, however, has its biggest opportunity in the specially contributed health article, which can touch on any subject likely to be of interest. Sometimes these health articles are signed by the doctor who has written them, but this is not always desirable and very rarely necessary. The whole essence of the good medical article is that it should be readable and understandable; the reader should learn satisfactorily from it. Humour is not out of place, and the homely approach is the best. Many journals are ready to make a feature of health and to give much space to a profusely illustrated article on health subjects as distinct from disease, but it is well known that the public has a voracious appetite for articles on tuberculosis, cancer, child welfare, venereal disease, physiology of sex, psychology, and especially the subjects which are not discussed in the ordinary social round. So far as the special magazines are concerned, those which deal with nothing but health for the layman, especially when a particular cult is stressed, are actually preaching to the converted. The aim of health education is to convert, however, and there is no doubt that the ordinary newspaper or popular periodical is the best medium for such work; here is given to the information supplied that great chance to appeal to the disinterested layman, who, discovering the medical article among others, reads it, becomes interested and follows up subsequent medical articles. The circulation figures of any publication are calculated by experts, who have a wide knowledge of the field of distribution, and the greater the circulation the greater the chance of making converts.

Leaflets.—The leaflet is useful when it is used in the right way. The average man or woman who has a flimsy, badly printed, ugly looking bill in black and white thrust into the already laden hand at the suburban tube station, may be expected to crumple it up in disgust and throw it away. Experts in publicity stress the following points. The paper must be good, preferably with an art finish; the most attractive colours are blue, brown and green, but an artist may devise a colour scheme which commands attention by its very beauty. The type may be in black or colour, whichever is more apt for the purpose. The matter must be terse, arresting, easy to understand. Leaflets may be issued as a series, with a story running through. There can be no denying the fact that the leaflet which arrives by post is more successful than one which is handed out on the street. Very often there is some *cachet* attached to the leaflets bearing on a special subject, and famous artists may be employed; nurses in any populous area must be familiar with many. The slogan is established as a permanent servant in the cause of health.

Posters.—Much which has been said above with regard to leaflets applies to posters, but in the case of the latter the initial cost is high and space for display must be paid for every day the poster is on view. Again, the less said the better is the motto, but what is said should be in bold characters and vigorous colour; it is always questionable whether many of the smaller types of poster are better than few of the big size. A great deal depends upon the sites.

Films.—The difficulty with regard to films is that health propaganda is in the eyes of the distributors, the cinema proprietors and, indeed, the patrons, something that is outside the programme proper. This is quite evident when it is considered how great are the pains taken by advertisers, for instance, to make any publicity films as nearly as possible on the lines of the documentary or educational film. Health offers many openings of great interest, however. Apart from the public showing of films, education in health can be, and is, carried out by use of the smaller type of film and by showing it at lectures, demonstrations, group meetings, and so on. For instance, in World War II, the army authorities made special use of films on hygiene to teach the elements of sanitation, destruction of flies, personal hygiene, and various other subjects to troops in camps and barracks. In villages and small towns the film is one of the most useful ways of telling the health story, since the village hall attracts most of the inhabitants when there is a cinematograph display included in the programme. In small group meetings, too, private projection sets may be very useful. Yet another side to film propaganda is that which is carried on by means of the travelling cinema, projection taking place on a screen at the back of the van.

Broadcasting.—Despite the many and various ways of using the radio, there are difficulties. It has to be realized that all listeners do not want to hear a health talk, and therefore a click of a switch removes the offending voice; this may endanger the success of any health campaign. Broadcasts to schools are in a separate class; they have their uses in a special way. The type of broadcast that seems to appeal most to listeners is the short, pithy, conversational talk, in which humour is moderately displayed and in which the lesson to be learned is plain.

Schools.—It will be recalled that at several places in this work mention has been made of the opportunity given to teachers and special lecturers in schools to give lectures and demonstrations on health, first aid, home nursing and other topics. In many schools today, health education is part of the curriculum and certain periods in the weekly time-table are given over to study of the fundamentals of health knowledge. The Central Council for Health Education is ready to give all assistance to schools in the matter of provision of certain appropriate material for teaching. It has already been said how much can be taught on the practical side by physical training instructors and gymnastic teachers, and how the school nurse can play her part in the health education of the school child. So far as issue of leaflets is concerned, there is a certain subtle type of propaganda here, for many of these leaflets will be shown to parents at home and the lesson contained therein is meant for all eyes to see. In many cases the scheme of education in health is directed by the school medical officer, who may draw up his own plans and hold conferences with, or send circulars to teachers, explaining the fundamentals of his scheme and inviting their collaboration in giving elementary health instruction to the various classes of boys and girls. Children appear to be interested in health when it is taught properly; so far as first aid and home nursing is concerned, when there are team competitions for trophies or individual tests for badges or prizes, it is well known how eager the competitors become.

Sex Education.—The amount to be taught in schools on any health subject depends upon the type of school, the views of the headmaster or headmistress and the claims of ordinary educational subjects. In the higher forms or classes, it may be possible to introduce certain topics of physiology as applied to the human being, and this may be done by lectures given, perhaps, occasionally, but not oftener than once a fortnight, by experts on various subjects, or as a course of talks by one very well qualified person and entirely suitable for the important work. Among subjects discussed it might be wise to include sexual physiology and psychology; there has been much controversy over this, just as there has always been when one medical "secret" after another

has been given away to the public, but all things considered, education for senior boys and girls, dealt with separately, in the facts of procreation and reproduction will do much good from every point of view, and the subject might well be included in the curriculum of every school of senior grade.

Social Services and Public Agencies

* It is not advisable, nor is it necessary, to enumerate the many forms of social service now available; society has become so complex that there are thousands of demands for help and thousands of ways of supplying it. The State is gradually absorbing the health services, including many of the voluntary bodies and public agencies which undertook to lend aid in certain specific branches of medical supply and of social service generally. Nevertheless, although many charitable (a deplorable word) organizations may in the near future become defunct, it will not be because they have ceased to be necessary; rather it will be that their activities will be transferred to some branch of State administration. The motive of all these societies has been right, but perhaps, in some cases, the application of their bounties is now likely to be made in a wider field; there can be no doubt that the general demand for assistance is greater, rather than less, than it was before the days of the National Health Service. The next task before us in this work is to examine what is being done officially and unofficially so far as assistance is concerned towards payment of expenses incurred by the emergency of illness, accident or permanent unfitness. To use the simplest words, the need is to know how much money is distributed, where it comes from, why it is necessary and where it goes. This makes it advisable that the work of the almoner should be studied and incidentally that it be noted how far health may be affected by poverty. It is necessary to find out about social insurance and all that it comprises, to examine pension schemes, to learn of family allowances, to review the applications of public assistance, and lastly to investigate the activities of various voluntary organizations. As a postscript, the pattern of the modern health services recently introduced into Great Britain (and at the time of writing still undergoing all the discomforts of teething), is given a brief general examination.

The Work of the Almoner

In the earlier chapters of this section it was shown that under the auspices of social medicine, no case of illness would be complete unless many domestic details, chiefly those concerning financial circumstances, were investigated by an expert. There

have always been almoners, but within recent years the demand on their services has been increased enormously. Almoners now exist in substantial numbers, and they have to qualify for their duties by examination.

Training.—In the first place those who wish to become almoners are approved of by the Institute of Almoners. The latter has devised a scheme of training in subjects appropriate to the almoner's work, such course taking 2 to 3 years according to circumstances. Among the subjects studied are social economics, psychology, social administration and industrial history; on the practical side a certain amount of experience has to be gained in office management and administration, and investigation of cases naturally comes prominently into the syllabus, with visiting of families and taking of notes. In most cases the probationers spend a year in hospital, studying the methods of trained almoners. There is an examination in the theoretical branches, after which a Certificate or Diploma of Social Study may be awarded. Finally, after a certain approved period of practice as an almoner under supervision, the probationer may be admitted as an Associate Member of the Institute of Almoners.

Duties.—There is not the slightest doubt that the number of almoners will increase by leaps and bounds as the National Health Service extends its operations. The almoner is, indeed, essential to success in any future developments on socio-medical lines. The work done is very important, but greater scope may yet be given; generally speaking it amounts to investigation of the most tactful and delicate kind, the primary idea being to get a true general picture of the social conditions and the domestic entourage of any patient, especially of those who come to hospital as in-patients. Secondary activities of the almoner are to help the medical authorities in having treatment faithfully carried out; to assist in any rehabilitation or resettlement measures; to give general help in various ways to those just discharged from hospital; to look after the chronic invalids, the incurables or those sent to their own homes for treatment there by the general practitioner. Senior almoners, like senior nurses, may be given the responsibility of instructing probationers in the work of the almoner, and of acting as liaison officers between the almoner staff and the medical and nursing staff, even to the extent of giving lectures on the work and its scope. The almoner might be called the fairy godmother of the patient for there is nothing in the way of supply she apparently fails to achieve, inside and outside of the hospital. So far as special branches of medicine are concerned, we find the almoner active and useful, not only in the ordinary routine of fact-gathering, but also for example, in cases of tuberculosis, pregnancy and child-birth, venereal diseases and mental deficiency. One very important function is carried out by the

almoner—investigation of real poverty. It is well known how proud people are when they are poor, and yet this is the time when they may need help most. The almoner by her investigations of home conditions and of the health of those associated with such conditions may succeed in checking at an early date the destructive forces of poverty and starvation.

Social Insurance

One of the greatest difficulties of the past was provision for the emergency of sickness. The average human being will not face up to the facts of economics of the unexpected emergency; it may be wishful thinking, but he shuns the idea of apportioning so much of his earnings for sickness, accident, loss of work and all the other negative occurrences of his career—indeed, the “rainy day.” Until recently social insurance has, indeed, been given a back seat. It is true that various clubs have been organized in the past and have done what they could for invalid members, but the truth must be known: the citizen has had to be forced (not necessarily against his will) to become insured. The present era sees the achievement of many aims which have been in existence for many years.

Unfortunately, it is not possible in the space at our disposal to do more than give passing mention to certain aspects of social insurance, but in the following pages a review is made of the main schemes in operation today. These include voluntary and compulsory insurance for sickness and accident, life insurance and pensions.

Voluntary Insurance.—In the days before the State intervened and accepted the responsibility of providing systems of monetary and other provision for those sick or injured or disabled, or unable to work on account of old age, the only course open to the citizen was to make a private arrangement with a company or a society dealing with insurance for payment of sums of money during or on account of health emergencies. Many great corporations were established and huge funds accumulated. So far as the working man was concerned he was satisfied to join a club or a friendly society and pay in so much per week on the promise of receiving certain weekly allowance during the period of incapacity. In the event of death, and because of the desire on the part of most men and women to have a properly dignified burial ceremony, workers were also in the habit of subscribing to burial societies; thus, funeral expenses of all kinds were paid in advance and the death of a member of the household did not put any severe strain on the domestic purse.

Life Insurance.—In certain classes, and chiefly so far as men

were concerned, and, indeed, are still concerned, it was customary to take out an insurance policy for a substantial sum, generally £1,000 and upwards, this sum to be paid to the next of kin, or to a named person on the death of the policy-holder. There are many variations so far as private life insurance is concerned; it applies to those who are capable of earning good salaries or of making fair profits out of business, and companies specializing in this work of insurance have devised schemes to suit all types of men and women and all grades of income. Thus the sum insured may be added to by profits or it may be payable before death, generally after 25 payments have been made. Here we see the example of provision made independent of the State for expenses of funeral and other charges associated with demise, for old age and even for disability. Many people took the precaution also to insure themselves against sickness, accident and other medical emergencies. All these services are available today, but it remains to be seen how much their scope will be affected by recent Acts of Parliament.

Compulsory Insurance.—Since modern legislation has effected sweeping changes at least in the organization and methods, if not in the principles, of insurance, it is advisable to review in brief the main events of the past 50 years which have led to the present situation.

Probably the best starting-point would be the period when the growing murmur of disapproval of the poor laws was heard, in the last years of the nineteenth century. Ultimately a Royal Commission was set up in 1905, and a report was published in 1909. It was not a unanimous report, and it is interesting in that the wishes of the majority and of the minority were ultimately realized. The majority wanted to see a public assistance authority set up to look after the poor; this authority would effect decentralization by means of various voluntary aid committees, and the latter would investigate and deal with any and every person applying for assistance. The minority considered that poverty should not be allowed to occur; the task before the State was to make the lot of the classes likely to be involved in this relief better and more stable so far as wages and other emoluments were concerned. Undoubtedly these views of both sides were shared by the people, for the Poor Law Commission was the starting point of many propositions to help the lower-paid workers. The Acts of Parliament speak for themselves: Old Age Pension Act, 1908; National Health Insurance Act, 1911; End of Local Government Board, 1919; transfer of poor law activities to local authorities, 1929. We refer to some of these measures, but perusal of the Acts concerned will provide a useful history of the rise of the regime of assistance and insurance in and for ill-health and various other conditions.

Benefits.—During 1911-48, the National Health Insurance Act regulated the payment of contributions, the services of doctors, the provision of drugs and appliances and the distribution of benefits, the scheme affecting millions of adult persons. In practice the moneys payable were distributed by various societies approved of for the purpose. These societies made payments to sick persons on production of certificates granted by doctors on the panel of medical practitioners pledged to serve under the Act. The doctors were paid a capitation fee, and there were many activities on both the medical and the benefit side. The finance necessary for this scheme was obtained by making the employer and the employee pay so much per week as a subscription. The fundamentals of this method still remain in the National Insurance Act of 1946 (see later).

Unemployment Insurance.—By various Acts, unemployment insurance has become established as intrinsic to the industrial world of today (see later). By a system of contributory payments made weekly, the employer and the worker add to a fund from which benefits are paid at local offices when the worker has shown proof that he or she is genuinely unable to find occupation. Needless to say there are many qualifying regulations, but unemployment insurance, as explained later, has become less complicated by reason of recent legislation.

Injuries.—Under the Workmen's Compensation Acts, provision was made for any worker who became disabled by injury "arising out of, and in the course of, employment" (a phrase which has had very far-reaching consequences). When death was the result of injury at work, compensation also had to be paid to the next of kin. The employer was liable, and generally insured himself against his liabilities, so that a private insurance company generally dealt with these cases, which occasionally reached the Court. A scale of weekly payments was laid down, and it was possible to claim compensation for permanent incapacity. In certain listed industrial diseases which might cause detriment to the health of those exposed to certain agents—chemicals, fumes and so on—compensation might also have to be paid by the employer. The above facts are given on account of their historic importance, and especially to illustrate how existing methods arose.

Pensions.—Although many firms, public bodies and private individuals made a habit of pensioning off their employees of long service and of seeing that they were comfortable for the rest of their lives, such *ex gratia* payment was never satisfactory, and the distribution of pension money was uneven, for it did not apply universally. A contributory pensions scheme was launched in the Widows', Orphans' and Old Age Contributory Act. This matter is also dealt with later on, but the principle

must be considered; it is that all who subscribe to national insurance also subscribe to the contributory pensions scheme. The benefits are variable, and are fully dealt with under the new National Insurance Act, 1946, which is analysed later in this chapter, especially so far as allowances are concerned.

Family Allowances

The economic situation of the present time, not to speak of the uncertainty of all human affairs, is reflected in the widespread limitation of families. This is by no means a good thing for the State. It is true that various birth control clinics are in operation but these deal with women who have had several children with very little space between confinements or with those who have some residual disability from a previous confinement and whose life might be endangered if further pregnancies were to occur. Apart from these comparatively small groups, however, there is a multitude of married women who have one child only or at the most two children. The Victorian family that often reached 10 or 12 is a thing of the past. The Government views declining birth rate with concern, and wants to see the average family much bigger. It has, therefore, made investigations and in 1942, Sir William Beveridge (now Lord Beveridge), drew up a plan for children's allowances, and in time this was modified and framed into the Family Allowances Act of 1945. This Act states that from public funds, and without contributory payments, a sum of 8 shillings per week will be paid for all children in a family of 2 or more, except the eldest. The sums cease to be paid when the child reaches the age of 16.

Qualification for Benefit.—There are 3 main groups of families mentioned in the Act as being qualified for benefit, and it is interesting to learn how widely the Act applies. First, there is the normal family, with husband and wife living together, and having their own offspring; additional children qualified to receive benefit are those within the age limit of 16 and who may be children of one of the parents only, e.g. by previous marriage; other children in the household, so long as they are maintained, may qualify; the main point is that the State will pay so long as the children are being maintained and cared for. Secondly, a man may not have a wife, or he and his wife may be separated; any eligible children living in this man's household, whether they be his children or not, are entitled to be paid for at the usual rates. Thirdly, as a parallel to the second case described, a woman may be living apart from her husband, or her husband may have died; if she has any children of her own (more than 1) or is responsible for the maintenance of eligible children, she may draw children's allowances. The money may be received at any

post office. It should be kept in mind that family allowances are available to all, no matter what the status, income, personal health or social position of the drawer may be. The payments come under the department of the Minister of National Insurance.

Public Assistance

The slow but certain demise of the Poor Laws, which began in 1905, and continued for over 20 years, is characteristic of the British hatred of charity in any form. By 1929, the Local Government Act had been passed, and by its provisions any remaining functions of the poor law authority were transferred to local authorities such as county councils and county borough councils; poor law was dead at any rate so far as its unwelcome nomenclature was concerned. All the associated activities were taken over by the local authorities mentioned above. The former poor law administration was taken over by a committee, referred to as the Public Assistance Committee, this committee being made up as follows: two-thirds of the members from the elected members of the local authority concerned; one-third co-opted. In widespread areas, such as those administered by county councils, subdivision of such areas into lesser areas was ordained; these smaller areas were to be under the supervision of a Guardians' Committee, which would supervise all allocation and distribution of relief.

Functions.—The above paragraph does not pretend to cover all the fundaments of Public Assistance, but it may serve as an outline of the general plan of the scheme. Let us examine the main functions of the present-day Public Assistance Committee and see what is being done. In the first place the Public Assistance Committee exists for the purpose of finding out in any community all the persons who are for some good reason without sustenance and who are not able to be given any help from the various funds referred to in the preceding or subsequent pages. The Committee is responsible for investigation of these cases, and for granting relief as soon as possible, the main idea being that no one, however he may be responsible, may be allowed to suffer from want of sustenance and shelter. The relief may take the form of money payments or of material provision of food, clothing, domicile and so on. The local authorities have very widely applicable powers under the Local Government Act of 1929, and without going into detail it may be said that provision for the destitute, no matter what the circumstances may be, is ample.

Assistance in the Home.—It should be made clear in the first place that the Public Assistance Committee is an organization distinct from the Assistance Board which formerly dealt with

unemployment assistance. This is important because it has to be remembered that public assistance is available for the able-bodied, employable members of the community who for some reason do not have the right to enjoy the privileges of the various funds concerned with and administered under various recent Acts. That is to say, as is well known generally, the great majority of working men and women are qualified for benefits (when the latter may be required) but there is, indeed, the small minority, who for some reason or other have not had a job in which compulsory contributions to the State have been effective, and, therefore, in the emergency may be without funds. For this minority, provision may be made in various ways. For instance, after careful consideration of any particular case, the local Assistance Committee may grant relief in monetary or in material form or in both; the essential point is that the basic needs are met. It is also within the power of the Committee to recommend that any person should be admitted to the workhouse during the period of destitution.

So far as the sick or disabled person is concerned—the person not able to work—the payments and relief are as described above, but it is always within the scope of the Committee's administration at least to offer relief in an institution and to press for such procedure when the medical report is one that stresses the benefits to be obtained from such transfer. But there is, apart from the above group, a great number of old persons, orphans, widows, cripples and many others unable to earn a livelihood, and in this category many live in their own homes, relief being provided as described above. The term, outdoor poor relief, is used to describe the assistance given to people at home and it must be remembered that in certain circumstances, such relief may be granted in addition to any other funds or supply drawn under the various schemes of insurance in operation today. A word should be added with regard to those who come within the definition of the term, destitute sick. The latter may have their medical attention provided for, the local authority paying for such service and employing doctors, either whole-time or part-time, to meet the needs.

The Public Assistance Institution.—The workhouse may have survived in name despite the awful example of Bumble and the many improvements that have been made in the past century; for the most part, of course, it may not be a workhouse, but still on the original pattern, a refuge for the orphan, the destitute, the mentally afflicted, the pregnant woman and many others in various states of ill-health. The tendency today is to deal mainly with the able-bodied, for all the others find that there is an increasing supply of assistance apart from public assistance and provided by the local authority under various other schemes

based on Public Health and other Acts. Some space must be left for the children, the purely senile persons and the chronic sickness cases, not capable of being improved by any active treatment, however. With regard to children, the nursery residential school, already referred to, is probably the most suitable place, but older children up to the age of 16 may be quartered in cottage homes; the latter are under the supervision of a superintendent. Lastly, a child may be given over in charge of foster-parents. In the case of the man or woman in the state of what is more aptly described as "aged and infirm," there are 2 categories—the mobile and the bedridden. With regard to the former, there is a growing demand for, and provision of, hostels, these being specially organized and administered to suit the cases and conditions. This scheme is more or less on trial, but it seems almost certain that the aged of the future will have to be specially catered for in this way. So far as the bedridden are concerned, provision of hospital accommodation is the only advisable course to be taken; this is not a very difficult matter, the infirmaries offering satisfactory and suitable medical and nursing service.

Voluntary Organizations

The history of health in Great Britain will always be associated with the voluntary worker and with the voluntary organization. Looking back on 100 years of progress, we see clear evidences that desire for betterment sprang from the individual in the first place, and help towards that betterment was provided by those who had time and money and the will to help. Social and political factors, interwoven with the solid development of industrialism, gave rise to alarming reactions; the people realized that they were tied to the industrial machine and fear gripped the majority; work meant life; but uncertainty of work, slumps and poor health were all factors threatening any stability of life. Furthermore, to meet the sudden demands of the industrial revolution, the people had to be drawn from the country to the towns and there housing and other conditions were not compatible with the increased burden put on the community; the result was the slum, disease, poverty and the "submerged tenth." It need hardly be remarked that charity, the very name of which stinks in the nostrils of all free and independent people, was the normal reaction to this state of affairs. This is not the place to discuss the merits or the demerits of charity or of those who made it their hobby; nor is it necessary to come to any decision as to the urges that caused people of a certain class and type to become associated with it; some may have had prickings of the conscience, some the instinct of the almsgiver, some the fear of evil arising from a despairing populace. Suffice it to say that charitable activities were

widely in vogue, and without them the story of medical progress might have been a much sorer tale than it is today. It was only when the citizen realized that by apportioning some of his earnings to funds which insured him for the emergency he could destroy the bogey of penury and starvation, that charity began to decline. Recent Acts appear to have reduced the openings for charity very considerably, and despite all the excellent records and the undeniably Christian benevolence of the charitable organizations, it cannot be said that a nation could not hold its head up more proudly when the need for such worthy organizations disappeared.

Charity and its Application.—The work of the Charity Organization Society speaks for itself; this great movement has been of the greatest assistance, especially in cases in which medicine is concerned, in ensuring that charity might be distributed in the most suitable and most useful way. To enumerate the many voluntary organizations associated with medicine—and they are well in the majority—would require a volume. Fortunately the Central Council for Health Education has many Health Associations affiliated to it, and a review of the published list, together with various others not affiliated, gives a rough idea of the extent of charitable application, from the enormous spread of the British Red Cross Society to the specialized work of the Chadwick Trust, the National Association for the Prevention of Infant Mortality and the Youth Hostels Association. There are nearly 100 Health Associations alone, and the total number of general and local, lay and ecclesiastical organizations interested in human welfare and pledged to help human beings to the better enjoyment of life must be many times that number.

The Future.—What the future course of events will be it is not possible to envisage; undoubtedly the functions of most of the voluntary organizations will remain, for the aim and ideal is right. Everyone who seeks happiness for his fellows will, however, pray that the need for voluntary assistance may disappear and that the science of economics will make its influence universal so that the State will ensure for its citizens security against every emergency. In the last few pages of this work, the beginnings of this great movement may be examined and a study of the main Acts concerned may help to enlarge our vision of things to come.

The New Pattern of Health Service

At the present day there is in being a "revolution by gradualness" the beginning of which is uncertain and the end of which is obscure. In the many references which have been made already in this work to the milestones in medical progress, it will have been clear that mankind has resolutely decided to wrest itself

from the grip of disease and to ally itself with the natural forces of health. This great decision has come when human beings have seen the folly of hygienic error and have experienced the discomforts of the insanitary life. Nowhere can the process be better exemplified than in Great Britain, which has always been a pioneer in health betterment and in health research. Careful study of the work of Parliament in the matter of health reform and also of the important legal measures now put into practice will show how great is the extent of the plan to bring the enjoyment of good health to the people.

Development.—The changes referred to above have not been effected simply by the naming of one "appointed day." The Acts recently passed are but the consummation of decisions arrived at, plans made, beliefs expressed and hopes maintained, all with regard to health and welfare and covering more than half a century of controversy. The steps taken to reach the stage at which we find ourselves today have been discussed already. The ultimate goal of social reformers has not yet been reached, but to develop the appropriate football metaphor, there is strong play in midfield and promising moves are in action. Much experience has been gained by the operation of Acts already reviewed, such as the National Health Insurance Act, and by the running of pioneer schemes such as the now-famous Peckham experiment (the Pioneer Health Centre); modern research and close application of thought to present-day problems (e.g. geriatrics) have made it possible for the organizers of healthy schemes to plan the edifice now being erected on principles that will benefit all classes of society and all ages of men and women.

The main Acts in relation to health which have recently come into force in Great Britain (apart from Education Acts and certain other measures) are the National Insurance Act of 1946, the National Insurance (Industrial Injuries) Act of 1946, and the National Health Service Act of 1946. Each of these may now be examined in some detail.

National Insurance Act, 1946

This Act, which came into operation in July 1948, was a necessary prelude to the National Health Service Act; it is concerned mainly with monetary payments in various events, most of which are dealt with below.

General Provisions.—The following arrangements, many of which have been reviewed in the preceding pages, are now superseded by the Act: schemes for cash payments under the old National Health Insurance Act; all the machinery of payment of old age pensions, widows' pensions, orphans' allowances; schemes for payment of unemployment insurance. It need hardly

be said that all the above cash payments continue to be made but the administration is different.

Contributions.—The contributions are paid weekly. Three sources exist—the employee, the employer, the State. Self-employed persons are in a different category, as are those who are not employed. The Act applies to all with the following exceptions: married women who do not want to make any contributions, persons who have retired; children; various other persons who for some reason are exempt. Otherwise the Act applies to everyone. It is unnecessary to discuss category or scales of payment since these are stated on every card, and the latter requires to be read, approved and signed by the person insured. Nurses are recommended to read these cards carefully. The salient point is that for every contribution made by a man, woman or boy or girl under 18, the sum of 10 pence, 8 pence or 6 pence respectively will be paid by the Treasury into the funds of the National Health Service.

Benefits.—The following benefits are now available under the Act: sickness benefit; unemployment benefit; maternity benefit; widows' allowance; pensions for retired persons; death grant. These may be outlined below.

Sickness Benefit.—The basic rate is 26s. a week for a man or for a single woman, plus 16s. when there is an adult dependent at home (wife, mother) and 7s. 6d. for one child whether there be one or more in the family. When a married woman works and in any way comes under the provisions of the Act, and is living with her husband or given an allowance by him, she will be paid 16s. weekly as sickness benefit, but in the case of women contributing the main sum to the household (e.g. when the husband is an invalid), the usual maximum payment will be made—26s. weekly plus 16s. on account of the invalid husband. When the husband and wife are separated, and the latter has no obligation to the former and the former is not making any contributions to the latter, the 16s. is withheld. Persons under 18 unmarried and independent draw 15s. weekly.

Unemployment Benefit.—This is exactly the same as for sickness benefit, with the following exception. In the case of the employed married woman living with her husband, the unemployment rate is 20s. weekly, and the woman must not belong to the category of the self-employed.

Maternity Benefit.—This comprises the following: 1. maternity grant (£4 in the case of all insured men's wives, as well as to contributing women, with double grant for twins); 2. attendance allowance (£1 weekly for 4 weeks) for those who do not come into the employed or self-employed category; 3. maternity allowance (36s. weekly for 13 weeks, payable to employed or self-employed women). Obviously 2. and 3. represent alternatives.

Widow's Allowance.—For the first 13 weeks immediately following the death of the husband, the widow will get an allowance of 36s. a week, plus 7s. 6d. for the family, whatever the size of it may be. Subsequently the allowance may take the form of one of the following: 1. widowed mother's allowance of 26s. a week plus 7s. 6d. for the family, if any, the total sum of 33s. 6d. to be paid only for the period during which the child concerned is dependent on the mother; thereafter the widow's pension of 26s. will be paid, always provided that the woman concerned has reached the age of 40 and that her marriage took place ten years or more previously; 2. widow's pension, this amounting to 26s. weekly, when the widow was over the age of 50 when the husband died and when the marriage had existed for more than 10 years; in this case there are no children requiring to be supported.

Pensions on Retirement.—The Act states that after the age of 65 is reached in the case of men, and of 60 in the case of women, who have given up work, a retirement pension will be payable, the rate being 26s. per week. If a man should continue at work after the age of 70 (in the case of a women, 65), the full pension will be paid nevertheless. In the case of married couples, when the wife has not reached pensionable age, although her husband has done so, the total pension payable to the man may be raised to 42s. a week; since the wife may draw 16s. a week when she is of qualifying age, there is no real difference in the allowance made. In the case of the working wife, insured and qualified by her age for a pension, she is entitled to 26s. in her own right; in other words a man and his wife, both of whom have been paying insurance contributions, can count on a total of 52s. a week as retirement pension. There are various increases in specific cases.

Death Grants.—When any insured person dies, or when any dependent of that person dies a grant will be made to the next of kin. The maximum is £20.

Notes.—The most noteworthy changes brought about by the Act are as follows. Special offices are now established at convenient places all over Great Britain, these dealing with the local work of the Ministry of National Insurance, receiving and issuing contribution cards, and generally supervising the working of the Act for the district. The Approved Society is a thing of the past. Various alterations in procedure may be made in special cases.

National Insurance (Industrial Injuries) Act, 1946

This Act has sounded the death knell for the old Workmen's Compensation Acts, which were never popular and which were

cumbersome and often ineffective. As the title indicates, this Act provides for compensation to be paid for injuries sustained at work, almost exactly in the same way as sickness benefit is paid in the case of the National Insurance Act. Fatal accidents are included in the scheme. The old methods prevailing under the Workmen's Compensation Act have been outlined, and it is advisable to realize what the former conditions amounted to before considering the new schemes; it need hardly be added that the 1946 Act represents a great step forward. The central fund (Industrial Injuries Fund) represents a pool of moneys collected from the weekly contributions of the 3 sources concerned—employee, employer, the State—and is controlled by the Minister. The benefits to be provided are calculated on a flat rate for each worker, with additions for all who are directly dependent upon the injured person's earnings.

Weekly Contributions.—In the National Insurance scheme, in the various rates of weekly contribution shown on the cards, it should be noted that in Class 1 the sums mentioned cover industrial insurance, that is to say, by putting on a single stamp each week the full obligations are met by employer and employee. Actually the sums are as follows: the man pays 4d., the woman 3d., the boy under 18, 2½d., and the girl under 18, 2d. The employers add similar sums in each case. To the total the State adds one-fifth.

Qualifying Factors for Benefit.—The wording still remains as it always did. To qualify for benefit the worker must have a personal injury caused by accident "arising out of and in the course of" insurable employment. The benefits are paid always with a generous assessment of the motives of the worker, the predominant belief being that only a negligible minority would deliberately injure themselves and that all accidents are the result of some urge or motive primarily directed towards giving service to the employer. The technical clauses may well be left to the expert and experienced to apply; suffice it to say that in this Act nearly all the anomalies of the old Acts have been abolished, and the term, compensation, will soon pass out of the language so far as insurance for accident is concerned.

Payments.—The 3 kinds of benefit to be paid are as follows: 1. the Industrial Injury Benefit; this is paid to the worker who has had an injury causing him to cease working; 2. the Industrial Disablement Benefit; in severe cases of injury or in cases of permanent disability; 3. the Industrial Death Benefit; as indicated by its name, this benefit is payable to the widow of the deceased, or to the next of kin and covers allowances for children and other dependents. In the case of 1. the sum payable is 45s. weekly, plus 16s. a week for the wife and 7s. 6d. for the family, one or more. The limit is six months. In the case of

2. when the six-month period has terminated, a review of the case may show that there is substantial loss of capacity for work (mental or physical) or a permanent disability. The worker is now in the hands of a Medical Board. Various rates of disablement pension may be awarded by this Board, depending upon the degree of disability, the 100 per cent case being assessed at 45s. per week. Variations in the rates depend upon age and degree of disablement but it is laid down that lump sums in settlement will be paid to those who have 20 per cent. disability or less. It should be clearly understood that notwithstanding the fact that the worker is in receipt of a pension, he can go on working at a suitable job. Grants are made, however, to wives, dependents, and so on, when the injured person may have to go to hospital for treatment or when he is discovered not to be fit for any work at all. In the latter case, extra allowances are payable according to the case, up to a maximum of 40s. per week. There are special provisions for those partially incapacitated for the special work they may have done before the accident took place. In the case of 3. the widow receives a pension of 30s. per week when there is a family, for which a total allowance is made of 7s. 6d. weekly. So far as widows over the age of 50 are concerned, or those whose physical or mental state at the time of the husband's death was such that they could not support themselves, the 30s. rate will also be paid. All other widows in this category are entitled to a pension of 20s. weekly. As in the case of National Insurance, 36s. a week is payable for the first 13 weeks after the husband's death. In the case of women workers who are killed at work or who die of injuries received the husband may claim 30s. a week pension if it can be proved that he was maintained by his dead wife; various other special provisions are made to relatives or dependents.

Industrial Diseases.—As is well known, there is an official list of industrial diseases and of certain injuries which are associated with the type of work done. Under this Act, the benefits provided for ordinary accidents will apply here, special provisions being made for specific diseases, e.g. those caused by dust (pneumoconiosis).

National Health Service Act, 1946

It would be impertinent, as well as unwise, to try to explain this Act in a few pages. The only way to gain a full knowledge is to read the Act division by division and page by page. Already many analyses have been made, and quite a substantial literature of explanatory type is available. For all these reasons, the information now given is condensed and selected on account of its interest to the nurse.

Structure.—To explain how best a comprehensive health service for the community may be established, the Act is divided into certain parts and there are various schedules. The main parts are as follows: 1. Central administration; 2. Hospital and Specialist Services; 3. Health Services under the Local Authority; 4. General Medical, Dental, Pharmaceutical and Supplementary Ophthalmic Services; 5. Mental Health Services. Some of these have been referred to previously in this and other sections of this work. One of the main provisions of the Act is to set up a Central Health Services Council which will advise the Minister of Health, but the latter is responsible for the application of the whole Act in its every direction.

Hospital Services.—Under the heading of hospital services comes the specialist service, the obvious idea being to make the major treatment unit well run, well staffed, and well coordinated. These two services are dependent for their administration on Regional Hospital Boards, which are committees of medical and lay persons fitted to deal with the work involved. These boards might be regarded as the planning and directing departments, for most of the actual executive activities are in the hands of Hospital Management Committees, which as the name implies concentrates on the running of the individual hospitals. The Regional Hospital Boards undertake in most cases the supply of specialists for the whole region for which they are responsible. Actually 14 hospital regions exist, 4 in London and the Home Counties. In each Region as a rule there is first the university, secondly the teaching hospital, thirdly the medical students, fourthly the postgraduates, these forming the educational unit. These teaching hospitals, through their governing boards, are in close touch with the Regional Hospital Board, and thus supply of personnel is assured. Associated services are the emergency public health laboratory service and the blood transfusion service.

General Medical Services.—As already stated, in this group the following services are dealt with: medical, dental, pharmaceutical, supplementary ophthalmic services. As a governing body there is a specially elected Local Executive Council, the work of which concerns the county or the county borough, sometimes both when convenient. These Executive Councils must be in constant liaison with the Regional Hospital Boards; together they are responsible for the establishment of hospital management committees.

Local Health Authorities.—It has been emphasized at several points in this work that the local authority has been saddled with many new responsibilities; this is as it should be. Regarded as a whole these responsibilities refer to domiciliary services and general provision of help in the home, as distinct from the

service of the doctor or of the hospital. For instance, there are all the activities associated with midwifery, welfare of mother and child, health visitation, nursing in the home, immunization, ambulance transport and the health centres; most of these have been considered at some length already.

Mental Health Services.—The regional hospital boards have the main responsibility for these services. Both the mental hospitals and the mental deficiency institutions come under their jurisdiction. Specialists are appointed by the boards for the whole region and the child guidance clinics are attended by them. All measures referring to ascertainment and treatment of mental defectives in the community (see Chapter 8) come under the supervision of the local authority.

The Medical Practitioner.—When all the machinations of boards and committees at various levels are considered, when the coordination of health departments, civil servants, governors, executive councils and the man in the street is taken into account and when the mass of the sick and suffering is envisaged, it is to the doctor that everybody seems to turn, and the demand on his or her service is not by any means small. It is universally agreed that in this new great venture the "king pin" is the general practitioner. Unless the latter be enthusiastic, willing, actively interested and helpful, the result will be failure, at least to some degree. The doctors have their representatives on all the boards and committees, so that whenever there is discussion, the technical and professional aspects may be made clear. So far as the actual attendance on the sick is concerned, the doctor holds his consultations and makes his visits and is paid so much by the Government for doing so. The present-day doctor has been variously referred to as shopwalker, sorter, statistical clerk, but it is unfair to level any criticism, for not only is the National Health Service new and difficult, but the doctors are committed to many duties formerly not within their province, and there is no doubt that they are struggling manfully against rather heavy odds.

Nurses.—It should be noted that the nursing profession is represented fairly on the various boards and committees. For instance, there are 2 nurses and 1 midwife on the Central Health Services Council and at lower levels the nursing profession takes part in the work of certain committees.

Maternity Services.—Much of this has already been discussed. To sum up the position as it is today, and despite the fact that alterations may yet be necessary, we may agree that so far as specialist and hospital service is concerned, the pregnant woman is well catered for. The local health authority is responsible for the setting up and running of a service of midwives who will attend women to be confined in their own homes. The supply

of doctors is variable; in addition to this some doctors do not wish to undertake midwifery. It is lamentable that the remark has been allowed to pass that some doctors are not sufficiently experienced; the fact is that not a single licensing body will allow a doctor to practise unless he has shown proficiency in obstetrics as in all other subjects. Nevertheless, the feeling is very deeply rooted that in obstetrics, special proficiency must be proved, and since midwifery does not come within the range of the health insurance practitioner's duties, there is another course open, viz. to establish a professional local obstetric committee of 4 experts to pass judgment on those who wish to join any local maternity medical service. Extra fees are to be paid for this work.

The Health Centre.—This is the Temple of Aesculapius, dreamed of by so many practitioners with vision. Unofficial health centres may be set up, assuming that so many doctors of different accomplishment get together and find a suitable place; it is well known that much success has resulted from the work of such teams. That the doctor will, eventually, have to see his patients outside his home is almost certain, for recent experience has shown that the private house is far from suitable as a forum in which classification and categorization may be effectively carried out, or as an out-patient department.

The essentials of a satisfactory health centre, apart from the medical service, general and special, are good nurses with experience of administration, good clerical staff and good receptionists. There must be a certain direction of the people, just as the patrons of a theatre are shown to their seats and generally attended to during the performance. The people and the profession look forward to the establishment of these centres all over the country; it is not a new idea—America has tried it and approves of it. The centres envisaged by the Act are to be established by the local authority and are to be used as public health clinics and dental clinics and for various other purposes, and to be a success must be in conformity with modern ideas and conveniently and properly situated. Old buildings may suffice until time allows the occupation of up-to-date premises. All are agreed that the latter must have ample accommodation so far as consulting rooms for doctor and dentist are concerned, waiting-room facilities of the best type, a small room in which various minor treatments may be carried out, telephone room and provision for staff of nurses, almoners, clerks and others required to run the "paper" side of the centre.

Group practice, as already mentioned, has had its success, and the health centre may not always be possible of achievement; it may, therefore, be possible to establish, instead of the health centre, a less ambitious scheme of collaboration. Much will depend upon events of the years ahead.

Private Practice.—Of especial interest to nurses is the affirmation of the Minister that private practice is still open to doctors, since a full-time salaried State medical service is not contemplated. The nursing home, for instance, will continue to be independent. So far as hospital treatment is concerned, the private patient can go into hospital and pay for all treatment given and there is the system of providing amenity beds without any extra charge for insured patients who have been recommended to have privacy for some special reason, and for whom there is accommodation available.

Miscellaneous Provisions of the Act.—Among the many other provisions of the Act, there are several that call for special attention. In the first place there is the matter of the ambulance service not only to and from hospital, but from place to place. The local authorities now have the duty of organizing and running the ambulance service, which must provide for all emergencies. The great lead given by the St. John Ambulance Association in England and Wales, the St. Andrew's Ambulance Association in Scotland, and the British Red Cross Society (in all 3 countries) makes the problem less formidable than it would seem to be. Another important matter is home nursing and this is again the responsibility of the local health authority, for the Act states that it will be required to make arrangements for securing the attendance of nurses on persons who require to be nursed in their own homes. It is fairly obvious that the local authority will build on the existing services and will probably adopt their methods; the record of District Nursing is long and honourable. It is expected that the demand for this service will continue to increase. So far as provision of equipment on loan is concerned, it will be necessary for local authorities to establish stores from which articles such as bed-rests, bedpans, water-beds, air-pillows and so on, can be drawn for use by the home nurse. Another branch of work for development is that of the health visitor. The latter will be able to give advice on hygiene, disinfection, prevention of spread of infection to pregnant women, nursing mothers, children and sick persons. A matter which has already been referred to in this Section is the supply of home helps. Domestic help must be arranged for by the local authority which will appoint as many women as possible and even give them some training. These women, many of whom may be of middle age, will be of use in running the household during the illness or puerperium of the mother, in cases of senility, when there is a mentally deficient child in the house and in similar cases. Lastly, there is the very important provision of what is in effect a special branch of the almoner service: in order to ensure that after-care is effective, there is provision for very thorough enquiry into the conditions of the home.

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